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The Differences in Students' Academic Performance in Grade One Between Children Who Enrolled in Preschool and Those Who Did Not Enroll.

A Mini-Thesis
In Partial Fulfilment of the Requirement for
Master's Degree of Education in Mentoring

Rin Chanthy

December 2022

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The Differences in Students' Academic Performance in Grade One Between Children Who Enrolled in Preschool and Those Who Did Not Enroll

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មូលន័យសង្ខេប

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ABSTRACT

This study used a quantitative, causal-comparative research design in a primary school in Phnom Penh. There were 200 first-grade students who participated in this study, including students enrolled in preschool and students who did not. It compared academic performance of first-grade students' scores in Khmer Literacy and Math to determine if a significant difference existed between students enrolled in preschool and those who did not for the first semester. The study found that students who enrolled in preschool had significantly higher test scores than those who did not. Nevertheless, the findings provide valuable information regarding students' academic performance during their first semester. In addition, the study showed that students who enrolled in preschool performed much better than those who did not, especially in math. The researcher also discussed and provided several recommendations for future research and all stakeholders.

SUPERVISOR'S RESEARCH SUPERVISION STATEMENT

TO WHOM IT MAY CONCERN

Name of program: Master's Degree of Education in Mentoring

Name of candidate: Rin Chanthy

Title of thesis: The Differences in Students' Academic Performance in Grade One Between Children Who Enrolled in Preschool and Those Who Did Not Enroll.

This is to certify that the research carried out for the above titled master's thesis was completed by the above-named candidate under my direct supervision. I played the following part in the preparation of this thesis: guidance in research problem development, literature review, methodology, data analysis, and discussion findings.

Supervisor (Name): Kong Maneth

Supervisor (Sign): …….

Date: …….

CANDIDATE'S STATEMENT

TO WHOM IT MAY CONCERN

This is to certify that the thesis that I "**Rin Chanthy"** hereby present entitled "The Differences in Students' Academic Performance in Grade One Between Children Who Enrolled in Preschool and Those Who Did Not Enroll."

for the degree of Master of Education major in mentoring at New Generation Pedagogical Research Center is entirely my own work and, furthermore, that it has not been used to fulfill the requirements of any other qualification in whole or in part, at this or any other University or equivalent institution.

Signed by (the candidate): …….
Date: ……..

Countersigned by the Supervisor: ……
Date: …….

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List of Abbreviations

ECE	Early Childhood Education
MoEYS	Ministry of Education Youth, and Sport
SRP	School Readiness Program
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNECEF	United Nations International Children's Emergency Fund

CHAPTER 1: INTRODUCTION

This research provides the background to the study, statement of the problem, the purpose of the study and objectives of the study, research questions, and significance of the study. It also contains the operational definition of key terms. Finally, the chapter introduces the research methodologies employed in this research and the thesis outline.

1.1 Background of the Study

Countries worldwide have recognized the critical need for interventions for early childhood development to achieve inclusive education goals. According to a report by UNESCO (2009), "The World Declaration on Education for All, adopted in Jomtien, Thailand (1990), sets out an overall vision of universalizing access to education for all children, youth, and adults and promoting equity." This means being proactive in identifying the barriers that many encounters in accessing educational opportunities and identifying the resources needed to overcome those barriers (UNESCO, 2009). Every child, adolescent, and adult should have access to learning opportunities that meet their fundamental academic requirements (World Conference on Education for All, 1990).

Early Childhood Education (ECE) is an important stage of formal education for children to attend because of the benefits to their self-concept and social awareness (Ket, 2010). As children's brains develop quickly, early experiences and sufficient assistance for fostering learning will be a wonderful benefit in preparing them for the next levels of education (Nhil, 2020). This provides children with beneficial opportunities to develop their classroom setting, which directly impacts how well they learn throughout their first years of school. Early childhood interventions should be viewed as a long-term strategy for ensuring that all children have access to schooling from the start (UNESCO, 2009). More interestingly, in the Cambodian context, the school readiness program (SRP) was also introduced and ran for eight weeks. It was established in 2004 and designed for

children with no preschool experience. It was offered at the beginning of grade one in primary schools before the start of first grade; moreover, it helped improve students' speaking and reading but not writing among students examined at the end of first grade (Nonoyama-Tarumi & Bredenberg, 2009).

Current research reveals that preschool programs have made a positive impact on early literacy, social-emotional learning, and academic success (Barnett et al., 2012; Cunningham, 2010; Duncan & Magnuson, 2013; Invernizzi et al., 2010; U.S. Department of Education, 2014, as cited in Catrina & Rinyka, 2017). Concerns about children's academic performance in primary schools, where repeat and dropout rates are high each year, have attracted attention in early childhood education (Than, 2008). Since early childhood is a critical time for the development of cognitive skills, as revealed by cognitive neuroscience, ensuring that children attend early childhood education provides the foundation for inclusion (UNESCO, 2009). Numerous educators agree that children between the ages of three and five are at critical intellectual and social-emotional development (Ahmad, 2015; Burchinal et al., 2010; Cunningham, 2010; Dearing et al., 2009, as cited in Catrina & Rinyka, 2017). Participation in ECCE encourages children to enroll at six, improves their first-year academic performance, and promotes their transition to primary school (Roa, 2007, as cited in Ket, 2010). Preschool experiences reduce repeat and dropout rates by preparing children academically and socially for school (Rao & Pearson, 2009).

This study looked at first grade students in a primary school located in Phnom Penh. This primary school consists of 481 first-grade students including students with and without pre-school experience. There are three kinds of preschool such as public, private and community pre-school-the students have attended. The research also determined the academic performance of students who have attended a preschool before starting first

grade and compared their academic performance to a group of peers who did not attend a preschool. It sought to determine if a gap is present in their performance. This study also compared students' test scores to their academic performances throughout the first grade. The results of this study determine the effect preschool attendance has on first grade students and on student performance throughout the first semester.

1.2 Statement of the Problem

Early Childhood Education (ECE) has been defined as a key factor in increasing enrollment in primary school and building essential skills for students before studying in grade one. ECE has been encouraged by the expansion of community preschools, preschools within primary schools, private preschools, and home-based care programs. Still, coverage remains limited due to scarce physical and financial resources and limited capacity (MoEYS, 2010). MoEYS mentioned that "the quality and demand for services remains low, and there remains a large gap in coverage for those geographical areas where there is low admission and enrolment and high dropout rates in primary schools" (Early Childhood Education, 2022).

Furthermore, MoEYS raised the concern that investment in early childhood education services has yet to be equal and inclusive in response to the education sector's shared goals (MoEYS, 2021). Furthermore, only 43% of Cambodian children aged 3 to 5 are enrolled in ECE, whereas 68.5 percent of Cambodian children aged five are enrolled in various forms of ECE (MoEYS, 2022). 27% of children among 3-to 5-year-olds are on track in reading and numeracy development, and by the age of 17, 55% of adolescents drop out (MoEYS, 2022). The cause of the issue can be found in early education, which places less emphasis on the value of mastering fundamental literacy and numeracy. Another major problem with Cambodian children is that many are too immature in their physical, social, linguistic, and cognitive development when they enter primary school

(Rao & Pearson, 2009). They are unprepared for school due to malnutrition and lack of preschool experiences (Rao & Pearson, 2009).

Cambodian students continue to fall behind in school for a variety of reasons, including a lack of preparation for school, poor quality teaching and learning, and irregular attendance. As a result, many of them eventually drop out (MoEYS, 2022). In 2018, only 65 percent of six-year-old children enrolled in grade one of the primary school received early childhood education programs, although the Ministry of Education's aim for 2023 is 74.5 percent (MoEYS, 2021).

A study by Ntumi (2016) claimed that many parents are unconcerned about their children's education at the preschool level. They do not understand early childhood education but see it as time-wasting when they involve themselves. Some parents' opinions about early childhood centers as a playing ground, not a severe place for learning.

1.3 Research Purposes

This study examined performance of students in first grade and investigated the differences in students' academic performance between those who attended and those who did not attend preschool activities.

1.4 Research Objectives

1. To examine first-grade students' performance in writing, reading, numeracy and measurement tests in the first semester of the school year.

2. To investigate the differences in academic performance between first-grade students who enrolled and did not enroll in preschool in terms of literacy and math test scores.

1.5 Research Questions

1. How well can first grade students perform in their writing, reading, numeracy and measurement tests in the first semester of the school year?

2. Do first grade students who enrolled in preschool perform differently from those who did not enroll in preschool in terms of literacy and math test scores?

1.6 Significance of the Study

This study provided a scholarly perspective on the research in the field of preschools and its importance for students to be ready to study in the next grade. Understanding the situations of preschools in these target areas can help to reveal the underlying logic of all stakeholders' activities and can aid in the development of helpful strategies to reduce dropout rates and poor performance of students at the next level. More importantly, the study's findings beneficial to all stakeholders include MoEYS to work together with the government to increase preschool investments so that all children can attend kindergarten to develop skills that will prepare them for first grade to meet the education goal of 82.8 percent kindergarten attendance by 2030 (MoEYS, 2019). Additionally, the study provided management and school principals with a better understanding of how to emphasize the importance of preschool and encourage parents to take care of their children and enroll them in preschool. Last but not least, this study might help parents understand the value of preschool and encourage their children to register for it before starting first grade.

1.7 Operational Definition of Key Terms

Students' academic performance refers to the class examination scores in Math (numeracy, measurement) and Literacy (reading, writing).

Preschool refers to the education provided in educational institutions to children aged between three and five. There are three types of preschool in Cambodia: community preschool, public preschool, and private preschool.

CHAPTER 2: LITERATURE REVIEW

This chapter presents thoughts of the previous researchers on related literature to the concept of student academic performance. Literature is reviewed from textbooks, journals, articles, academic papers, and websites related to preschool and students' academic performance. The study provides insights into other people's work, findings, and the conceptual framework developed by the researcher.

2.1 Definition

2.1.1 Academic Performance

Several scholars have attempted to define and explain academic performance. As said by Narad and Abdullah (2016), academic performance is the information learned that is measured by a teacher's marks or educational goals set by students and teachers to be reached over a specified period of time, and these goals are measured by continuous assessments or examination outcomes. Similarly, academic performance is also emphasized as the result or product of the extent to which students, learners have achieved their academic goals and is typically measured through examinations, continuous assessment, and skills (W. Annie et al., 1996, as cited in Owo & Owo, 2019).

2.1.2 Preschool

Different psychologists, educationists, and policymakers have given other names to this type of education, namely early childhood education, nursery school education, kindergarten education, and pre-primary education in some contexts; these terms have similar meanings. (Bibi & Ali, 2012). Preschool education also refers to any systematic program that young children engage in before enrolling in primary schools and that aims to advance their social-emotional, intellectual, linguistic, and literacy abilities as well as their health and, most importantly, their overall well-being (Bibi & Ali, 2012). The role of

the preschool is preparing children to learn the letters, understand and addressed reading and writing.

2.2 Types of Preschool

2.2.1 State Preschools

State preschools which are located in primary schools, conduct 3-hour per day, five days a week during the 38-week school year (Rao & Pearson, 2009). Children are taught by a teacher who has completed a full-time professional preparation course undertaken in the teacher training center after Grade 12 (Rao & Pearson, 2009).

2.2.2 Community Preschools

Educational experiences for three to five-year-old are delivered in Community Preschool programs by a village member who has typically received ten days of initial training and three to six days of training course each year (Rao & Pearson, 2009). The program works for 2 hours a day, five days a week, for 24 to 36 weeks a year. The teaching methodology follows the same basic routine every day to provide kids with a sense of consistency and security (Rao & Pearson, 2009). Teachers receive training in areas such as health, nutrition, and psychological early child development, as well as diverse teaching styles, as volunteers who receive a small salary. Training is encouraged through refresher courses, meetings, and the technical monitoring provided by staff from the MoEYS. The overall objectives of the CPS are to improve Grade 1 school performance and enrolments of students at age six and to decrease Grade 1 dropout rates (Rao & Pearson, 2009). Community-based preschool program to help children enter school get psycho-social, behavior, Physical domains for increasing preschool into primary school improve rate (dropout, grade promotion, and repetition) and enhancing the performance of students in school (Martinez et al., 2012).

2.2.3 Private Preschool

Private preschool has good facilities and capacities in terms of teacher training, curriculum offered, tuition and fees, and the complete system of dealing with schools that need children's outcomes (Abhijit et al., 2013). Private preschool services have access to high-quality early childhood education programs delivered by point-qualified early childhood teachers, hours for a week, in public, private and community-based preschools and child care (Andrew & Kate, 2009 as cited in Duncan & Magnuson, 2013)

2.3 Why is Enrollment in Preschool Necessary for First Grade?

Numerous studies have revealed that children who attended quality early learning programs are more likely to achieve higher test scores and grades (Jenifer, 2010). The role of ECE builds fundamental for children to gain an understanding of the basic knowledge of Literacy and numeracy for future learning (Nhil, 2020). Children who receive ECE in a preschool or at home are more likely to be familiar with the fundamentals of academic study (Nhil, 2020). A study has found that enrolling in kindergarten affects math and reading test scores (Andrews et al., 2012). Those who attended preschool, compared to those who did not, had better attainment in language, pre-reading, and early number concepts after controlling for the influence of background characteristics (Taggart et al., 2015). Those who went to preschool did better in language, pre-reading, and early numerical concepts as well as in terms of independence, focus, cooperation, conformity, and peer sociability than those who did not (Taggart et al., 2015). Similarly, Students who attended preschool also showed better development in language, pre-reading, early number concepts, and nonverbal reasoning (Taggart et al., 2015). Preschool experiences reduce repeat and dropout rates by preparing children academically and socially for school (Rao & Pearson, 2009). In contrast, children who did not receive ECE seem to be slow to catch up with children who receive ECE (Nunez,

2022). Preschool education helps foster children's language acquisition, improve their vocabulary, develop early literacy and math skills, and promote society (Rose, 2010).

2.4 Student's Academic Performance

A student's academic performance is a key factor that affects their learning outcome (Anthony, 2018). Pupils who had preschool education performed better in academic subjects than pupils who had not attended preschool education (Bibi & Ali, 2012). Academic performance increased the quality of students' learning and provided long-term benefits for brain development (Bakken et al., 2017). Children who receive early education will develop up with more incredible communication skills, physical ability, the social cohesion they'll need in adulthood, and a balanced, more effective education (Bibi & Ali, 2012). Students who attended preschool before starting first grade did score significantly higher in math proficiency than their peers who did not attend preschool, but there were no significant differences between the two groups for either Literacy (Carroll, 2012)

2.4.1 Numeracy

Early math competencies are also a strong indicator of later math achievement. Early childhood education has a significant impact on the students' future achievements and excellent performance in central and fundamental subjects such as English, Mathematics, and Urdu (Bibi & Ali, 2012). Research from Gjelaj showed that first-grade students who participated in preschool had better math development than those who did not (2013). In preschool, children develop foundational number competence that supports more complex mathematics when they enter their first grade (Jordan et al., 2009).

2.4.2 Literacy

Several studies have shown that young children who receive thorough language and literacy teaching in the prekindergarten and kindergarten years can achieve great

early literacy achievement (Bingham et al., 2010). Children who attended high-quality preschool for 2-3 years were ahead in their literacy development compared to children who had not attended Preschool (Taggart et al., 2015). As stated by Haslip (2018), children who attended district preschool performed better in text-level reading ability, spelling, sight words, and letter sound identification than those who did not.

2.4.3 Behavior

Children who had attended preschool were becoming more responsible for their behavior because of their attendance at school, which increased as they aged. When they age, there is considerable evidence that a high-quality preschool education improves life outcomes (Bakken et al., 2017). Although the influence of preschool quality on social-behavioral development was smaller than at previous time points, kids who had attended high-quality preschools had better self-control, pro-social behavior, and less hyperactivity when they were 16 years old (Taggart et al., 2015). The students who attended preschool are confident in asking questions during the teaching and learning process. Most of them participate actively in classroom activities (Bibi & Ali, 2012). Children who have had the experience are not shy, confident, and have a large number of friends, so they do not hesitate to participate in games or other extracurricular activities and are better at their adjustment to the teacher (Bibi & Ali, 2012). On the other hand, children who did not attend kindergarten are frequently shy, afraid to speak to their teachers and classmates, and unable to use a pencil correctly (Than, 2008)

2.4.4 Socialization Skills

At five years old, a person's life is essential. At this age, a child begins to form positive relationships with those around them. (Hightower, 1999, as cited in Bibi & Ali, 2012). In addition, Bakken et al. (2017) mentioned that early education has long-term benefits for children in becoming increasingly skillful in their social skills as they

demonstrate increasingly advanced social skills: displaying appropriate behaviors, having good relationships, interacting socially, and responding to mature manner behavior. ECE gives the chance for children to play to keep their bodies healthy, engage with other kids to improve communication and collaboration, and use their imaginations to create something to foster their growth (Nhil, 2020).

2.4.5 Engagement in Learning

Pre-school significantly impacted students' perceptions of their primary school and the degree to which they expressed enjoyment at school. (Taggart et al., 2015). Children who have experienced it are more interested in their studies (Bibi & Ali, 2012). They were more responsible and completed the given assignments on time (Bibi & Ali, 2012).

CHAPTER 3: RESEARCH METHODOLOGY

The primary goal of this study explored the research questions that relate to the differences in students' academic performance in grade one between children who enrolled in preschool and those who did not. This chapter describes the research design, sample size and sampling technique, research instruments, data collection procedures, and data analysis.

3.1 Research Design

A quantitative causal-comparative design was chosen for this study. The causal-comparative research design was selected for several reasons. First, no manipulation of the independent variable enrolled or did not enroll in preschool. Participants were not randomly assigned to groups. Students were already set to preschool and non-preschool before the research began. The sample was selected from two pre-existing populations. The causal-comparative design is used when two groups differ on a variable. In this case, the researcher wishes to determine the consequences of this difference (Fraenkel et al., 2011).

3.2 Sample Size and Sampling Technique

This study was conducted at a public primary school in Phnom Penh. The researcher used a convenience sampling procedure to select participants for this study. Only first-grade students at the research site were included. There were 481 first-grade students in the 2021-2022 school year, which is the target population in the study. The school lacks the exact numbers of kids who enrolled and did not enroll in preschool; therefore, in order to get accurate information and data, the researcher decided to design a survey for students' parents to complete so that the researcher could get the real numbers of students. Based on the suggestion by Krejcie and Morgan (1970), the researcher should choose at least 200 students to participate in the study in order to represent the total

population. The researcher gave 300 information forms to teachers to provide to students' parents so that they could complete and answer some questions whether their children enrolled in preschool or not, as well as the type of preschool in which they enrolled, which is used to gain information about students' preschool experiences. Obviously, the researcher received 212 forms back and 200 forms have valid information, which means 109 students are enrolled in preschool and 91 students are not enrolled.

3.3 Research Instrument

The researcher used two main tools to collect data for this study: the students' information form and their assessment scores in the first three months of the semester.

3.3.1 Student's Information

The school did not have any record of how many students enrolled or did not enroll in preschool, so the researcher used students' information forms which included students' demographic information, sex, age, whether they joined preschool or not, type of preschool, and students' scores in three months.

3.3.2 School Exam Scores

Based on Cambodia's standard first-grade curriculum, Khmer literacy and Math have been defined as basic skill (Department of Curriculum Development, 2015). Learners are able to use language and math to understand, explain, describe and argue, coordinate, encourage, explore and solve problems in further study, daily life and professional work. Therefore, the researcher used these two assessment scores in three months of semester 1 to analyze statistics.

3.4 Data Collection Procedure

This section describes the procedures that the researcher did to collect data. In this study, the researcher used the above instruments to collect data and followed the following stages:

Stage 1: Asking for permission

Firstly, after receiving a permission letter from New Generation Pedagogical Research Center, the researcher approached the school principal to ask his permission to conduct this study. The researcher explained the research's purposes and submitted a consent letter to the school principal. After getting approval from the school principal, the researcher was allowed to meet the target teachers. The researcher then sent them the consent letter and asked permission to collect their students' information and scores.

Stage 2: Collecting student's demographic information

This study incorporated data collected from completing the forms and existing data sets in the form of students' information and monthly assessment scores. The researcher intentionally selected target participants to consist of students who enrolled and did not enroll in preschool. In this case, the researcher gave 300 information forms to teachers to provide to students' parents so that they could complete and answer some questions about whether they enrolled in preschool or not, as well as the type of preschool in which they enrolled, which is used to gain information about students' preschool experiences. Obviously, only 212 information forms were received, but only 200 have valid information. This is because some parents may not care, some parents may not know how to write, and some children did not provide the form to their parents.

In fact, the school lacks information about students who enrolled and did not enroll in preschool; therefore, it is hard for the researcher to get the exact numbers. In order to get the real numbers of how many students enrolled and did not enroll in preschool, the researcher designed a survey for the students' parents to complete. However, students are still kids, so when the researcher provided the survey to them, some did not give it to their parents to complete, and some parents perhaps could not write, which is why the researcher could not get enough participants. To address this, the

researcher contacted directly the parents of students who had not provided their children's information; finally, the researcher was able to obtain an adequate population to represent the study.

Stage 3: Collecting student's exam scores

The numeric data collected for this study came from three months in the first semester. After the approval was obtained, the school principal allowed the researcher to approach teachers in order to collect the test scores of the first semester. Scores were collected for 200 participants and recorded on the Excel spreadsheet, identifying students only by their state student identification number. The scores were collected on two subjects which include Khmer literacy (writing and reading) and Mathematics (numeracy and measurement).

Since some teachers were unwilling to comply, it was difficult for the researcher to gather the scores from them. Most teachers were unwilling to give researchers access to their students' test results because it would compromise their ability to educate privately. In order to deal with it, the researcher tried to explain the main goal of the study. The researcher also made a commitment to keep all information confidential and refrain from disclosing the participants' real names. Finally, the researcher asked the principal of the school for assistance and cooperation.

3.5 Data Analysis

After data collection, SPSS version 28 was used to analyze the data statistically. Initially, an Excel spreadsheet was created to organize students' demographic information, sex, age, whether they joined preschool or not, type of preschool, and students' scores in three months. Students were identified by their state student identification number only; no student names were included in the Excel spreadsheet. The Excel spreadsheet data were transferred to SPSS to prepare the data for analysis. All

variables were given a variable name and assigned a variable type (nominal, ordinal, scale). All data were coded in numbers. For example, the variable gender was coded as 0 =male and 1 = female. The researcher used a t-test to investigate the differences between students enrolled in preschool and those who did not enroll.

3.6 Ethical Considerations

Names of participants were not recorded or used during the process of the research, nor were they exposed in the research report. Instead, the researcher used students' ID numbers to replace their real names. The process and the findings of the study are available to those who have participated.

CHAPTER 4: RESULTS

This chapter reports the results, which consisted of two questions: How well can first grade students perform in their writing, reading, numeracy and measurement tests in the first semester of the school year? What are the differences in academic performance between children who enrolled and did not enroll in preschool? The following data were collected and analyzed to see the differences in students' academic performance between children who enrolled in preschool and their peers who did not. The findings organized by research questions.

4.1 Demographic Information

This study was conducted at a public primary school in Phnom Penh. Only first-grade students at the research site were included. There were 481 students enrolled in the first grade of the 2021–2022 school year. Some students enrolled in preschool before joining the first grade, and some students did not enroll. Among the 200 students included in this study, 109 enrolled in preschool, and 91 did not enroll in preschool. 93 students were male, and 103 students were female. Students who participated in this study were from 6 to 11 years old and enrolled in this academic year.

Table 1

Sex, Preschool Experience, and Age of Students

Variable	N	Percent
Sex		
Male	93	48.5
Female	103	51.5
Missing	4	2.0
Preschool Experience		
Preschool	109	54.5
Non-preschool	91	45.5
Age/years		
6	73	36.5

7	92	46.0
8	22	11.0
9	5	2.5
10	1	0.5
11	5	2.5

Note: N refers to the total number of each variable.

4.2 Students Enrolled in Preschool.

Table 2 shows that 109 students enrolled in preschool among 200 total students. Preschools are divided into community preschools, private preschools, and public preschools. Only 2 students (1.83%) enrolled in community preschool, whereas 84 students (77.06%) attended public preschool and 23 students (21.10%) attended a private preschool. Among them 47 students aged 6, 49 aged 7, 10 aged 8, 2 aged 9, and just one aged 10 among them.

Table 2

Students Enrolled in Preschool

Variable	N	Percent
Sex		
Male	52	47.7
Female	57	52.3
Type of Preschool		
Public-Preschool	84	77.1
Private-preschool	23	21.1
Community-Preschool	2	1.8
Age/years		
6	47	43.1
7	49	45.0
8	10	9.2
9	2	1.8
10	1	0.9

Note: N refers to the total number of each variable.

Table 3 shows the occupations of guardians of children enrolled in preschool. Their fathers mostly work as sellers, follow by company staffs, and the least jobs are doctor, worker, tailor, blacksmith, carpenter, journalist, security, painter and guide. Their mothers mostly work as sellers, follow by housewife, and the least jobs are worker, farmer, chef, officer and salon

Table 3

Guardian of Children Enrolled in Preschool

Occupations	Father		Mother	
	N	Percent	N	Percent
Jeweler	3	2.8	0	0
Engineer	2	1.8	0	0
Doctor	1	0.9	0	0
Company Staff	20	18.3	13	11.9
Soldier	6	5.5	0	0
Repairer	2	1.8	0	0
Teacher	15	13.8	11	10.1
Worker	1	0.9	1	0.9
Seller	27	24.8	43	39.4
Housewife	0	0	36	33.0
Tailor	1	0.9	0	0
farmer	3	2.8	1	0.9
Taxi driver	4	3.7	0	0
Blacksmith	1	0.9	0	0
Carpenter	1	0.9	0	0
Journalist	1	0.9	0	0
Chef	0	0	1	0.9
Orphan	4	3.7	0	0
Security	1	0.9	0	0
Painter	1	0.9	0	0
Officer	2	1.8	1	0.9

Guide	1	0.9	0	0
Police	6	5.5	0	0
Salon	0	0	1	0.9

Note: There are 18 different occupations

4.3 Students Did Not Enroll in Preschool

Table 4 shows that 91 did not enroll in preschool before they joined first grade, out of 200 total students. 45 students are male and 46 students are female. There were 26 students aged 6; 43 students aged 7, 12 students aged 8, 3 students aged 9, and 5 students aged 11.

Table 4

Students Who Did Not Enroll in Preschool

	N	Percent
Sex		
Male	45	49.5
Female	46	50.5
Age/years		
6	26	28.6
7	43	47.3
8	12	13.2
9	3	3.3
11	5	5.5

Note: N refers to the total number of each variable.

Table 5 shows the occupations of guardians of children did not enroll in preschool. Their fathers mostly work as sellers, follow by company staffs, and the least jobs are engineer, village chief. Their mothers mostly work as housewives, follow by seller, and the least jobs are doctor, teacher, worker, farmer, and chef.

Table 5

Guardian of Children Who Did Not Enroll in Preschool

Occupations	Father	Mother

	N	Percent	N	Percent
Jeweler	4	4.4	0	0
Engineer	1	1.1	0	0
Doctor	0	0	2	2.2
Company Staff	16	17.6	4	4.4
Repairer	5	5.5	0	0
Teacher	4	4.4	2	2.2
Worker	6	6.6	2	2.2
Seller	19	20.9	27	29.7
Housewife	0	0	41	45.1
farmer	4	4.4	2	2.2
Taxi driver	10	11.0	0	0
Carpenter	1	1.1	0	0
Chef	2	2.2	2	2.2
Orphan	3	3.3	0	0
Security	1	1.1	0	0
Village chief	1	1.1	0	0
Police	6	6.6	0	0
Salon	0	0	3	3.3

Note: There are 18 different occupations

4.4 First Grade Student's Performance

Table 6

First grade Students' Academic Performance in the First Semester

Variable	*M*	*SD*	*Minimum*	*Maximum*	*Percent*	
					X<5	*X≥5*
Writing	6.14	1.36	2	9.50	16.5	83.5
Reading	6.24	1.43	2.33	9.33	18.5	81.5
Numeracy	6.76	1.43	2.67	9.67	10	90
Measurement	6.80	1.47	2.67	10	10	90

Note: X = scores

After computing the relevant statistics on first grade student academic performance, mean and standard deviation scores have been found to be M = (6.14) & SD = (1.36) on Writing, M = (6.24) & SD = (1.43) on Reading, M = (6.76) & SD = (1.43) on Numeracy and M = (6.80) & SD = (1.47) on Measurement. On Writing, students scored in a minimum of 2 and a maximum of 9.50. The score lower than 5 consists of 16.5% and those who scored higher than or equal to 5 consist of 83.5%. On Reading, students scored in a minimum of 2.33 and a maximum of 9.33. The score lower than 5 consists of 18.5% and those who scored higher than or equal to 5 consist of 81.5%. On Numeracy, students scored in a minimum of 2.67 and a maximum of 9.67. The score lower than 5 consists of 10% and those who scored higher than or equal to 5 consist of 90%. On Measurement, students scored in a minimum of 2.67 and a maximum of 10. The score lower than 5 consists of 10% and those who scored higher than or equal to 5 consist of 90%.

This result indicates that first students perform better in Measurement than Writing, Reading and Numeracy for the first semester.

4.5 The Differences in Academic Performance between Preschool and Non-Preschool Students

Data on participants' sex, Khmer literacy, and math scores were collected and analyzed using SPSS.28. Students in this study included students who enrolled in preschool and those who did not enroll in preschool. The t-test, p-value, and standard deviation were used to determine whether existing scores were different between the independent variable.

Table 7

Comparison in Students' Academic Performance between Children Who Enrolled in Preschool with Those Who Did Not Enroll.

Variable	*M*	*SD*	*t*	*df*	*p*	*d*
Writing			-3.34	198	0.001*	-0.47
Preschool	6.43	1.31				

Non-Preschool	5.79	1.35				
Reading			-3.08	198	0.002*	-0.43
Preschool	6.52	1.39				
Non-Preschool	5.90	1.42				
Numeracy			-2.35	198	0.020	-0.33
Preschool	7.02	1.42				
Non-Preschool	6.53	1.50				
Measurement			-2.94	198	0.004*	-0.41
Preschool	7.03	1.37				
Non-Preschool	6.44	1.44				
Academic Performance			-3.12	198	0.002*	-0.44
Preschool	6.75	1.29				
Non-Preschool	6.17	1.32				

Note: Academic performance includes writing, reading, numeracy and measurement.

4.6 Writing

Table 7 shows that preschool students were statistically significant different from non-preschool students on writing, $t(198) = -3.34$, $p = .001$. Inspection of the two groups' mean indicates that the average writing score for preschool students ($M = 6.43$) is significantly higher than the score for non-preschool ($M = 5.79$). The difference between the mean is 0.64 points on a 10 points test. The effect size d is approximately -0.47, which is typical of a small to medium size for an effect size measure (Cohen, 1992). This result indicates that students who enrolled in preschool before first grade perform better than students who did not enroll in preschool in writing.

4.7 Reading

Preschool students were statistically significant different from non-preschool students on reading, $t(198) = -3.08$, $p = .002$. Inspection of the two groups' mean indicates that the average reading score for preschool students ($M = 6.52$) is slightly higher than for non-preschool ($M = 5.90$). The difference between the mean is 0.62 points

on a 10 points test. The effect size *d* is approximately -0.43, typical of a small to medium size for an effect size measure (Cohen, 1992). This result indicates that students who enrolled in preschool before first grade perform better than students who did not enroll in preschool in reading.

4.8 Numeracy

Preschool students were statistically significantly different from non-preschool students on numeracy, $t(198) = -2.35$, $p = .020$. Inspection of the two groups' mean indicates that the average numeracy score for preschool students ($M = 7.02$) is significantly higher than non-preschool ($M = 6.53$). The difference between the mean is 0.49 points on a 10 points test. The effect size *d* is approximately -0.33, typical of a small to medium size for an effect size measure (Cohen, 1992). This result indicates that students who enrolled in preschool before first grade perform slightly better than students who did not enroll in preschool in numeracy.

4.9 Measurement

Preschool students were statistically significant different from non-preschool students on measurement, $t(198) = -2.94$, $p = .004$. Inspection of the two groups' mean indicates that the average measurement score for preschool students ($M = 7.03$) is significantly higher than non-preschool ($M = 6.44$). The difference between the mean is 0.59 points on a 10 points test. The effect size *d* is approximately -0.41, which is typical of a small to medium size for an effect size measure (Cohen, 1992). This result indicates that students who enrolled in preschool before first grade perform better than students who did not enroll in preschool in measurement.

4.10 Academic performance

Preschool students were statistically significant different from non-preschool students' overall academic performance, $t(198) = -3.12$, $p = .002$. Inspection of the two

groups' mean indicates that the average writing score for preschool students (M = 6.75) is significantly higher than the score for non-preschool (M = 6.17). The difference between the mean is 0.58 points on a 10 points test. The effect size d is approximately -0.44, typical of a small to medium size for an effect size measure (Cohen, 1992). This result indicates that students who enrolled in preschool before first grade perform better than students who did not enroll in preschool in academic performance.

CHAPTER 5: DISCUSSION

This chapter discusses the quantitative findings of the research study about existing literature and how the results can add to the current research. It also discusses the two overall findings of students and test scores for those who attended preschool and those who did not. Finally, it explores the implications of the results for educational practice, future research, and policy.

The main aim of this study was to investigate the differences in students' academic performance between those who attended in preschool and those who did not by using an independent sample T-Test. The researcher used pre-existing data for students enrolled in each method of instruction to determine whether there was a significant difference between the two groups on those measures. Based on the result, it was evident that there was a greater difference in academic performance for first-grade students between those who enrolled in preschool and those who did not, especially in writing skills.

While regarding the difference in students' academic performance in first grade level, our findings were similar to the results of previous research which found that students who enrolled preschool perform better than those who did not (Bibi & Ali, 2012; Carroll, 2012). Table 7 compares students' academic performance between children who enrolled in preschool and those who did not enroll.

Table 7 shows that preschool students were statistically significant different from non-preschool students in terms of literacy skills. This result indicated that students who enrolled in preschool before first grade perform better than students who did not enroll in preschool in Khmer literacy skills. As mentioned previously, most evidence indicated that preschool produces great outcomes for children's achievement, including literacy skill. It is supported by these researchers who found that enrolling in preschool affects student's literacy skill (reading and writing) better attainment in language that prepared them to be

ready to catch up in their first grade, helped foster children's language acquisition, improved their vocabulary, developed early literacy (Andrews et al., 2012; Taggart et al., 2015; Bingham et al., 2010; Haslip, 2018; Rose, 2010). Students who attended high-quality preschool for 2-3 (low level, medium level, high level) preschool years were better in their literacy development compared to children who had not attended preschool (Taggart et al., 2015; Rose, 2010).

Based on the result in Table 6, preschool students were statistically significantly different from non-preschool students in math skills in terms of numeracy and measurement. This result indicated that students who enrolled in preschool before first grade perform better than those who did not enroll in preschool in math skills. These findings confirmed the previous researchers who stated that children who attended preschool, compared to those who did not, had better early number concepts and developed foundational number competence that supports more complex mathematics when they enter their first grade and better performance in this math skill (Jordan et al., 2009; Taggart et al., 2015; Gjelaj, 2013; Bibi & Ali, 2012; Rose, 2010). Early math competencies in preschool are also a strong indicator of later math achievement. Students who experience in preschool perform better and gain academic success in their math test scores. This is supported by Andrews et al. (2012) who found that enrolling in kindergarten affects math and reading test scores.

The results of this study contributed meaningfully to the literature by suggesting that children who enrolled in preschool are more ready for school than those who did not. The same thing mentioned by Bibi and Ali (2012), pupils who had preschool education, performed better in academic subjects than pupils who had not attended preschool education. Preschool experiences prepare the child academically and socially for school, and lowers repetition and dropout rates. Student's academic performance is very

important for students, especially in first-grade. The role of preschool is to prepare children to learn the letters, understand and address reading and writing. However, the result is different from research states that students who attended preschool before starting first-grade did scores significantly higher in math proficiency than their peers who did not attend preschool, but there were no significant differences in literacy (Carroll, 2012). Preschool experiences reduce repeat and dropout rates by preparing children academically and socially for school (Rao & Pearson, 2009). In contrast, children who did not receive this ECE seem to be slow to catch up with children who receive ECE (Nunez, 2022). Providing children with ECE increase their academic performance, especially through their first year in grade one. This also mentioned in a study that participation in ECE encourages children to enroll at six, improves their first-year academic performance, and promotes their transition to primary school (Roa, 2007, as cited in Ket, 2010).

CHAPTER 6: CONCLUSION, LIMITATIONS, AND RECOMMENDATIONS

This chapter concludes the results of the study found from the study. It provides three main aspects: conclusion, limitations and recommendations.

6.1 Conclusion

The purpose of this causal-comparative research study was to determine whether a significant difference exists between the academic performance of students enrolled in preschool and those who did not. Results showed that a significant difference did in fact exist. Students who enrolled in all types of preschools are a strong indicator of later literacy and math achievement. In contrast, children who have no experience in preschool seem to be at risk of difficulty in their literacy and math skills. This result is supported by numerous scholars who stated that enrolling in preschool affects student's literacy skills (reading and writing) and math skill (Jordan et al., 2009; Taggart et al., 2015; Gjelaj., 2013; Bibi & Ali, 2012; Rose., 2010). However, the usefulness of this finding is limited because the scores that the researcher used in this study were from only ten teachers in the first semester. This means that this study only considers students' performance during the first semester, rather than the entire year. Nevertheless, the findings of this investigation gave the research site information that will be valuable for planning in the future. It reveals that when children are unprepared for school, they will continue to fall behind in school. As a result, many of them eventually drop out. Therefore, participating in preschool is not a time-wasting but helps children build their school readiness before they enter grade one. So, all stakeholders, such as educators, and school principal, should work together to promote the importance of preschool to all children. All children should have the opportunity to attend preschool before they enter first grade.

6.2 Limitations of the Study

There were several limitations to this study. First, when looking at school data used in this study did not take into account students who were previously identified as having a learning disability, being developmentally delayed, or already receiving services within the school or extra class.

Secondly, existing data or monthly scores in semester one were getting from teachers that could be biased because teachers may have different ways of giving scores to their students. In this case, the researcher had no control over all data.

One final limitation that comes from the study is the researcher used convenience sampling to select students by teachers, and some parents who got information forms may not know how to read or do not care about it. Among 300 forms provided to teachers, 212 forms were returned back.

6.3 Recommendations

The data presented in this study shows a difference in proficiency scores between students who attended preschool programs and students who did not attend preschool programs in their first grade. While all students who participated in some types of preschool program had higher proficiency scores than students who did not participate in preschool prior to starting school, the students who did not attend preschool programs had lower proficiency scores in literacy and math when compared to their peers who attended preschool.

Knowing this, all management and school principals should emphasize the importance of preschool and encourage parents to understand the value of preschool and encourage their children to register for it before starting first grade. School principals are recommended to keep all data about preschool and non-preschool.

Parents should try to spend more time with their children and get involved in their education, especially during their first year of school. Moreover, they should get their children to attend preschool in order to prepare them for starting first grade.

Additionally, further study is recommended to evaluate the students involved in this study again in several years to compare whether or not the data results remain consistent as the students progress through each grade. Monthly scores and preschool experience significantly influence student achievement in first grade, but those results could greatly vary in future studies of the same children using the same variables that were included in this study.

MoEYS is recommended to increase the number of preschools to meet the need of ECE. This can increase number of preschoolers to prepare them for first grade and develop their school readiness.

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APPENDIX A: STUDENT INFORMATION FORM

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

សាលាបឋមសិក្សា.....

សម្រង់ព័ត៌មានសិស្ស

ថ្នាក់ទី១.....ឈ្មោះសិស្ស.....ភេទ..... អាយុ.....

ឈ្មោះឪពុក.....មុខរបរ.....ឈ្មោះម្តាយ.....មុខរបរ.....

អាណាព្យាបាលឈ្មោះ.....មុខរបរ.....។

ប្រវត្តិរបស់សិស្ស៖

- តើកូនរបស់អ្នកធ្លាប់បានចូលរៀនមត្តេយ្យដែរឬទេ?
  ☐ ធ្លាប់ ☐ មិនធ្លាប់
- បើធ្លាប់ តើកូនរបស់អ្នកធ្លាប់រៀនសាលាមត្តេយ្យប្រភេទណា?
  ☐មត្តេយ្យរដ្ឋ ☐មត្តេយ្យឯកជន ☐មត្តេយ្យសហគមន៍

Kingdom of Cambodia
nation religion king

……Primary School

Student information

Class..... student´s name.....sex..... age.....

Father´s name.....job.....Mother´s name.....job.....

Guidance´s name.....job.....។

Background of student៖

- Did your children enroll in preschool?
  ☐ yes ☐ No
- If yes, what type of preschool did they enroll in?
  ☐Public Preschool ☐Private Preschool ☐Community Preschool

APPENDIX B: CONSENT LETTER

ព្រះរាជាណាចក្រកម្ពុជា
ជាតិ សាសនា ព្រះមហាក្សត្រ

មជ្ឈមណ្ឌលស្រាវជ្រាវគរុកោសល្យជំនាន់ថ្មី
NEW GENERATION PEDAGOGICAL RESEARCH CENTER

ថ្ងៃចន្ទ ៩កើត ខែពិសាខ ឆ្នាំខាល ចត្វាស័ក ព.ស. ២៥៦៥
រាជធានីភ្នំពេញ ថ្ងៃទី៩ ខែឧសភា ឆ្នាំ២០២២

សូមគោរពជូន

លោក ..... នាយកសាលាបឋមសិក្សា.....

កម្មវត្ថុ៖ សំណើសុំការអនុញ្ញាតឱ្យគ្រូនិស្សិតឈ្មោះ **នែន ចាន់ធី** បានចុះប្រមូលទិន្នន័យស្រាវជ្រាវលើប្រធានបទ "**ភាពខុសគ្នានៃការសិក្សារបស់សិស្សថ្នាក់ទី១ រវាងសិស្សដែលបានចូលរៀនមត្តេយ្យនិងសិស្សមិនបានចូលរៀនមត្តេយ្យ**" នៅសាលាបឋមសិក្សា.....។

សេចក្តីដូចបានជម្រាបជូនខាងលើនេះ ខ្ញុំសូមជម្រាបជូនលោកនាយកថា គ្រូនិស្សិតឈ្មោះ **នែន ចាន់ធី** កំពុងសិក្សាស្រាវជ្រាវសរសេរសារណាបទបញ្ចប់ថ្នាក់បរិញ្ញាបត្រជាន់ខ្ពស់អប់រំ ឯកទេស **ប្រឹក្សាគរុកោសល្យ** ជំនាន់ទី៣ នៅមជ្ឈមណ្ឌលស្រាវជ្រាវគរុកោសល្យជំនាន់ថ្មី នៃវិទ្យាស្ថានជាតិអប់រំ។ ការចុះប្រមូលទិន្នន័យរបស់គ្រូនិស្សិតនឹងប្រព្រឹត្តទៅចន្លោះពីថ្ងៃទី៩ ខែឧសភា ដល់ថ្ងៃទី១៥ ខែកក្កដា ឆ្នាំ២០២២។

អាស្រ័យហេតុនេះ សូមលោកនាយក មេត្តាជ្រាប នឹងអនុញ្ញាតឱ្យគ្រូនិស្សិតរូបនេះ ជួបលោកគ្រូ-អ្នកគ្រូដែលជាគ្រូទទួលប្រឹក្សាគរុកោសល្យផ្តល់ព័ត៌មានទាក់ទងនឹងប្រធានបទស្រាវជ្រាវខាងលើ ដោយគ្មានអនុក្រោះ។

សូមលោកនាយកទទួលនូវការគោរពរាប់អានដ៏ស្មោះអំពីខ្ញុំ។

ប្រធានមជ្ឈមណ្ឌល

ឯកសារ មសគ
៩

បណ្ឌិតសភាចារ្យ **ចាំន្ត រ័ត្ន**

ព្រះរាជាណាចក្រកម្ពុជា

ជាតិ សាសនា ព្រះមហាក្សត្រ

<u>ពាក្យស្នើរសុំធ្វើការស្រាវជ្រាវ</u>

នាងខ្ញុំឈ្មោះ **វិន ចាន់ធី** ជាគរុនិស្សិតកំពុងសិក្សាបរិញ្ញាបត្រជាន់ខ្ពស់ ឯកទេសផ្នែកប្រឹក្សាគរុកោសល្យ នៅមជ្ឈមណ្ឌលស្រាវជ្រាវគរុកោសល្យជំនាន់ថ្មីនៃវិទ្យាស្ថានជាតិអប់រំ។ នាងខ្ញុំកំពុងធ្វើការសិក្សាស្រាវជ្រាវលើប្រធានបទ "ភាពខុសគ្នានៃការសិក្សារបស់សិស្សថ្នាក់ទី១ ក្នុងចំណោមសិស្សដែលបានចូលរៀនមត្តេយ្យនិងសិស្សមិនបានចូលរៀនមត្តេយ្យ" ។

១. គោលបំណងនៃការស្រាវជ្រាវ

ជាការពិតណាស់ ការសិក្សាស្រាវជ្រាវត្រូវបានធ្វើឡើងក្នុងគោលដើម្បីរុករកនូវ ភាពខុសគ្នានៃការសិក្សារបស់សិស្សថ្នាក់ទី១ ក្នុងចំណោមសិស្សដែលបានចូលរៀនមត្តេយ្យ និងសិស្សមិនបានចូលរៀនមត្តេយ្យ" នៅសាលាបឋមសិក្សាព្រះ.....។ អ្វីដែលសំខាន់ជាងនេះទៅទៀត លទ្ធផលដែលបានរកឃើញពីការប្រមូលទិន្នន័យពីភាគីពាក់ព័ន្ធដូចជា លោកគ្រូ អ្នកគ្រូ ថ្នាក់ទី១ ទាំងអស់ នឹងផ្តល់ព័ត៌មានយ៉ាងសំខាន់ក្នុងការរួមចំណែកជាឯកសារយោង ដែលជាមូលដ្ឋានគ្រឹះសម្រាប់បង្ហាញអ្នកពាក់ព័ន្ធទាំងអស់ក្នុងវិស័យអប់រំដូចជា គណៈគ្រប់គ្រងសាលា គ្រូបង្រៀនឲ្យយល់ដឹងពីភាពខុសគ្នា ក៏ដូចជាបញ្ហាដែលខ្លួនអាចនឹងជួបប្រទះពេលបង្រៀនសិស្សដែលមិនបានចូលរៀនមត្តេយ្យ។ លទ្ធផលនៃការសិក្សាមួយនេះអាចនឹងក្លាយទៅជាឯកសារយោងដ៏ដសំខាន់សម្រាប់ចំពោះសិស្ស និស្សិត សាស្ត្រាចារ្យ គ្រូបង្រៀន ក៏ដូចជាស្ថាប័នពាក់ព័ន្ធសម្រាប់យកទៅធ្វើការស្រាវជ្រាវបន្ថែមទៀតលើប្រធានបទនេះឲ្យកាន់តែស៊ីជម្រៅ។

២. ដំណើរការនៃការស្រាវជ្រាវ

ប្រសិនបើលោកគ្រូ/អ្នកគ្រូយល់ព្រមចូលរួមក្នុងការសម្ភាសន៍នេះ នោះលោកគ្រូ/អ្នកគ្រូនឹងត្រូវស្នើរសុំឱ្យផ្តល់ជាពិន្ទុរបស់សិស្សទាំងអស់។ អ្វីដែលសំខាន់នោះគឺរាល់ព័ត៌មាន និងឯកសារទាំងឡាយដែលទាក់ទងនឹងលោកគ្រូ/អ្នកគ្រូ នាងខ្ញុំនឹងរក្សាការសម្ងាត់ជូន ដោយពុំមានការបង្ហាញព័ត៌មានផ្ទាល់ខ្លួនរបស់លោកគ្រូ/អ្នកគ្រូក្នុងការស្រាវជ្រាវឡើយ ប្រសិនបើពុំមានការអនុញ្ញាតពីលោកគ្រូ/អ្នកគ្រូដែលជាសាមីខ្លួន។

៣. គោលការណ៍រក្សាការសម្ងាត់

ព័ត៌មានទាំងអស់នឹងរក្សាការសម្ងាត់ ដោយមានតែអ្នកស្រាវជ្រាវតែម្នាក់ដែលអាចប្រើប្រាស់បាន។ វាមិនមែនជាតេស្ត ហើយក៏គ្មានចម្លើយខុសឬត្រូវដែរ។ ការចូលរួមរបស់លោកគ្រូ/អ្នកគ្រូពិតជាមានសារៈសំខាន់ណាស់សម្រាប់ខ្ញុំ ហើយខ្ញុំសង្ឃឹមថាលោកគ្រូ/អ្នកគ្រូ អាចចូលរួមក្នុងការសិក្សាស្រាវជ្រាវនេះ។ វាជាជម្រើសរបស់លោកគ្រូ/អ្នកគ្រូ បើទោះបីលោកគ្រូ/អ្នកគ្រូ ចង់ឬមិនចង់ចូលរួមក៏ដោយ។

៤. ការទំនាក់ទំនងមកអ្នកស្រាវជ្រាវ

ប្រសិនបើលោកគ្រូ/អ្នកគ្រូមានសំណួរ ឬបញ្ហាណាមួយពាក់ព័ន្ធនឹងការស្រាវជ្រាវនេះ សូមលោកគ្រូ/អ្នកគ្រូទំនាក់ទំនងមកកាន់ខ្ញុំផ្ទាល់ដែលជាអ្នកស្រាវជ្រាវតាមរយៈលេខទូរស័ព្ទ: ០៩៦ ៣៩៥ ៦២៨៩(តេឡេក្រាម) និង E-mail: kanhathy41@gmail.com ។

៥. កិច្ចព្រមព្រៀងក្នុងការចូលរួម

គោលបំណងរបស់ការស្រាវជ្រាវបានពន្យល់យ៉ាងច្បាស់ដោយអ្នកស្រាវជ្រាវ ហើយខ្ញុំនឹងចូលរួមក្នុងការសិក្សាស្រាវជ្រាវមួយនេះ។ ខ្ញុំដឹងថា ខ្ញុំអាចឆ្លើយឬ មិនឆ្លើយនូវសំណួរណាមួយដោយគ្មានលំក្ខខណ្ឌអ្វីទាំងអស់។

អ្នកចូលរួម _____	**អ្នកស្រាវជ្រាវ**
កាលបរិច្ឆេទ៖	កាលបរិច្ឆេទ៖ _____
ហត្ថលេខា៖ _____	ហត្ថលេខា៖ _____
ឈ្មោះ៖ _____	ឈ្មោះ៖ _____

APPENDIX C: STUDENTS' ACADEMIC PERFORMANCE IN THREE MONTHS

Table 1

Non-Preschool Student Academic Performance

ID	Sex	Age/year	Khmer			Mathematics		
001	0	11	5	3	4	4	3	4
002	1	7	6	6	7	7	8	4
003	1	7	7	5	8	7	6	6
004	1	6	3	4	4	4	4	3
005	1	7	8	7	4.5	8	9	4
006	1	9	4	6	4.5	4	8	4
007	0	8	6	6	8	8	8	6
008	1	7	3	3	5	4	4	4
009	0	7	2	1	3	2	2	3
010	0	7	3	1	2	2	2	3
011	0	7	3	2	5	2	4	5
012	1	7	5	5	3	4	4	4.5
013	0	8	6	7	6.5	8	8	6
014	0	6	4	3	4.5	4	4	5
015	1	6	6	5.5	5.5	4	5	6
016	0	7	5	5	4	5	4.5	9
017	0	8	6	5.5	8	7	6	8
018	0	6	5	6.5	6	6	7	6.5
019	0	7	4	6	6	5	6.5	6
020	1	8	7	6	7.5	8	6.5	7
021	1	7	6	5.5	6.5	5	6	6.5
022	1	6	7	6.5	7	7	7	7.5
023	0	7	5	5	6.5	5	5.5	6.5
024	0	6	5	4.5	5	4	5	5.5
025	1	9	6	4.5	5	5	5	5
026	0	6	5	5	5.5	6	5.5	5
027	1	6	8.5	8	7	9	7	8
028	1	7	6	8	7	6	8	3
029	0	8	4	5	8	6	5	5
030	1	6	2	6	9	3	6	10
031	1	7	5	6	9	5	6	8
032	0	8	7	5	7	7	7	6
033	1	7	5	5	5.5	6	5	5
034	1	8	4	6	5	3	5	5
035	1	11	8.5	9	7	7	7	8
036	0	8	5	4	5	4	4	7
037	1	6	3	5	3	4	5	4
038	0	8	7	7	7	6	6	8

Table 2

Preschool Student Academic Performance

ID	Sex	Age/year	Khmer			Mathematics		
092	1	6	8	9	10	7	7	7.5
093	0	7	6.5	7.5	8	7.5	8	9
094	1	7	7	7.5	7.5	7	8	8
095	1	7	6.5	7.5	7	6.5	7.5	8
096	0	9	6	6.5	7.5	7	7	7
097	0	7	6	3	2	5	4.5	3
098	1	7	6	6.5	6	7	6	6.5
099	1	6	6	6	7	7	6	7.5
100	0	7	5	5	4	5	4.5	4.5
101	0	7	4	5	4	4	4	4
102	0	7	5	6.5	7	5	6	7
103	1	7	4	5.5	6.5	4	6	6.5
104	0	7	5	5	5	5	5.5	5
105	1	8	5	5	5	6	5	5
106	1	9	5	8	9.5	8.5	8.5	4.5
107	1	6	4	3	3	4	4	4
108	0	6	5	5.5	6.5	4	6	6.5
109	0	6	3	3	4	3	4	4
110	0	10	6	6	8	7	6.5	8
111	1	7	8	8	8	8	8	8
112	0	7	5	3.5	4	4	4	4
113	0	7	5	4.5	4.5	5	5	5
114	0	6	5	5.5	6	5	6	6
115	1	7	5	5	5	6	5.5	5
116	1	7	5	4	4	4	4.5	4
117	1	8	5	6	6	6	6.5	6
118	1	7	7	8	8	8	8	8.5
119	1	6	6	6.5	6.5	6	7	6
120	0	6	5	6.5	6.5	6	7	6
121	0	7	9	7	8	10	8	7
122	1	6	4	6	7	5	2	3
123	0	6	6	8	7	4	7	6
124	1	6	8	7	7	7	9	9
125	0	6	6	7	5.5	7	7	6
126	1	6	7	8	8	7	8	7
127	1	8	7	6	5	5	5	6
128	1	7	8	8	8	7	8	9
129	1	6	5.5	6	8	6	7	7

039	0	7	9	9	9	8	8	9	130	0	6	6	6	6	5.5	6	6
040	0	88	6	7	6	5.5	8	5	131	1	6	5	5	5	4	4	5
041	0	6	5	6	6.5	6	6	8	132	1	7	7	7	6	6	7	6
042	0	6	4	4	4	4	4	5	133	0	6	4	3	5	5	4	5
043	0	7	5	3.5	7	4	4	4	134	1	6	7	8	7	8.5	7	8
044	1	6	9	9.5	10	9	9	10	135	0	7	9	8	9	8.5	9	10
045	1	7	7	6.5	5	6.5	6.5	6	136	1	6	9	9	9	8	7	9
046	0	7	6	6	5	7	6.5	7	137	0	7	7	6	5	6.5	7	8
047	0	7	7	7	6	7	7	7	138	0	7	7	6.5	5.5	8	6.5	6
048	0	7	5	4	4	4	4	5	139	0	6	7	7	7	7	7	7
049	1	11	7	7	7	7	8	6	140	0	6	9	10	9	8	10	8.5
050	1	7	7	7	7	7	7	7	141	1	6	7	6	9	6	7	9
051	0	6	6	9	9	6	8	9	142	0	7	7	7	5.5	8	7	8
052	0	7	7	8	9	8	9	9	143	0	6	4	4	4.5	4	5	6
053	0	6	5	6	7	6	6	7	144	1	7	8	8	10	8	8	9
054	0	9	6	5	7	6	6	7	145	0	7	6.5	6.5	6	8	7	7
055	1	6	5.5	5.5	3	6	6	5	146	1	7	5.5	5.5	5	6	6	6
056	0	7	7	7	7	8	9	8	147	1	6	6	6	5	7	7	6
057	1	7	5.5	5.5	5	6	6	7	148	1	8	7	7	8	8	8	7
058	1	7	6	4.5	6	7	8	7	149	0	7	8	8	7	9	9	9
059	1	11	7	7	5	7	6	5	150	0	6	8	7	7	8	8	8
060	1	6	5.5	5	4	5	5	4	151	0	8	7.5	6.5	8	7	7	8
061	1	7	5.5	5.5	5	7	6	7	152	1	8	8.5	8.5	8	9	8	9
062	1	6	5.5	5.5	6	5	7	6	153	1	6	8	8	8	8	8	9
063	1	8	8	8	8	8	8	8	154	1	6	6	7	7	7	6	8
064	1	7	8	7	7	8	8	8	155	1	7	7.5	7.5	7.5	8	7	8
065	1	7	7.5	7.5	7	8	8	8	156	0	6	5	5	4	6	6	5
066	0	88	5	6	6.5	7	7	8	157	1	6	7.5	7.5	8	8	8	8
067	1	7	6	6	5	6	6	6	158	0	7	5	5	6	6	5	6
068	1	8	8	8	8	8	8	8.5	159	0	6	5.5	5.5	6	6	6	7
069	0	6	6	6.5	6	6.5	6	5	160	1	7	8	7	7.5	9	8	9
070	0	7	5	5	5	5	4	3	161	0	7	4	55	7	5	5	7
071	1	6	8	7	8	7	7.5	7	162	0	8	7.5	7.5	7.5	8	8	8
072	1	6	6	8	6	7	8	5	163	1	7	5.5	7	6	6	7.5	6
073	0	7	7	7	6	6	6	6	164	1	7	8	7.5	8	8	7	8
074	1	7	5	5	6	5	5	5	165	0	7	6	6	8	6.5	6	8
075	0	7	5	5	5	5	5	5	166	1	7	8	7	8	7.5	7	8
076	0	6	5	5	4	4	4	4	167	1	7	7	7	5	7	7	6
077	0	7	5	5	5	4	5	5	168	0	6	5	6	5	7	6	6
078	0	6	5	7	4	4	5	4	169	1	6	5	7	6	4	5	6
079	1	11	7	8	8	7	8	8	170	1	7	8	8	8	8	7	8
080	1	6	7	6	7	7.5	7	7.5	171	0	6	6	5	5	5	5	4
081	0	6	5	4	5	5	4	3	172	1	7	7	6	7	7	6.5	7

082	1	7	5	5	5	5	4	5
083	1	7	6	6	5	5	6	6
084	0	7	5	5	6	5	6	5
085	0	7	5	6	6	4	6	6
086	0	8	6	6	5.5	6	5	6
087	1	7	6	5	6	6.5	5	5
088	1	7	7	6	6	6	6	5
089	0	7	5	5	5	4	5	5
090	1	7	5	5	5	5	6	5
091	0	6	5	5	4	4	5	4

Note: male = 0 female = 1

173	0	7	5	5	6	6	5	5
174	1	7	5	5	5	6	4	5
175	1	6	8	8	8	8	8	8
176	1	6	8	8	8	8	7	8
177	1	6	5	6	5	6	5	6
178	1	7	6	6	6	6.5	5	6.5
179	0	6	6	6	6	5	5	5
180	1	7	7	7	6	6.5	6.5	6
181	0	7	8	8	7	7	8	7
182	1	6	6	6	[a]	5	5	5
183	0	7	8	8	8	8	8	8
184	1	8	7	7	8	7	7	7
185	1	7	5	5	6	5	6	5
186	0	7	7	8	8	7	8	7.5
187	0	6	7	7	7	7	7	7
188	0	6	8	9	8	8	9	9
189	1	6	6	6	6	6	6	5.5
190	0	6	8	9	8	8	9	9
191	1	8	4	5	5	4	3	4
192	0	7	6	6	5	6	5	6
193	0	6	5	5	4	4	4	4
194	0	6	7	6	6	7.5	6.5	6.5
195	1	8	8	8	8	8	8	8
196	1	6	5	5	5	4	5	4
197	1	7	7	6.5	6	8	6	5.5
198	0	6	6	7	6	6	7	6
199	0	7	6	6	6	7	6	6
200	0	6	6	7	6	6	6.5	6.5

Note: male = 0 female = 1

APPENDIX D: STUDENTS' PERFORMANCE

Statistics

		TotalW	TotalR	TotalM	TotalN
N	Valid	200	200	200	200
	Missing	0	0	0	0
Mean		6.1433	6.2425	6.7642	6.8000
Std. Deviation		1.36643	1.43652	1.43540	1.47423
Minimum		2.00	2.33	2.67	2.67
Maximum		9.50	9.33	9.67	10.00

TotalW

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00	2	1.0	1.0	1.0
	3.33	3	1.5	1.5	2.5
	3.67	4	2.0	2.0	4.5
	3.83	1	.5	.5	5.0
	4.00	3	1.5	1.5	6.5
	4.17	2	1.0	1.0	7.5
	4.33	4	2.0	2.0	9.5
	4.67	11	5.5	5.5	15.0
	4.83	3	1.5	1.5	16.5
	5.00	13	6.5	6.5	23.0
	5.17	4	2.0	2.0	25.0
	5.33	14	7.0	7.0	32.0
	5.50	4	2.0	2.0	34.0
	5.67	15	7.5	7.5	41.5
	5.83	4	2.0	2.0	43.5
	6.00	13	6.5	6.5	50.0
	6.17	6	3.0	3.0	53.0
	6.33	13	6.5	6.5	59.5
	6.50	6	3.0	3.0	62.5
	6.67	14	7.0	7.0	69.5
	6.83	2	1.0	1.0	70.5
	7.00	9	4.5	4.5	75.0
	7.33	11	5.5	5.5	80.5
	7.50	4	2.0	2.0	82.5
	7.67	9	4.5	4.5	87.0
	7.83	2	1.0	1.0	88.0
	8.00	13	6.5	6.5	94.5

	8.17	1	.5	.5	95.0
	8.33	3	1.5	1.5	96.5
	8.67	2	1.0	1.0	97.5
	9.00	3	1.5	1.5	99.0
	9.33	1	.5	.5	99.5
	9.50	1	.5	.5	100.0
	Total	200	100.0	100.0	

TotalR

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.33	2	1.0	1.0	1.0
	3.33	1	.5	.5	1.5
	3.67	5	2.5	2.5	4.0
	4.00	9	4.5	4.5	8.5
	4.17	3	1.5	1.5	10.0
	4.33	9	4.5	4.5	14.5
	4.67	7	3.5	3.5	18.0
	4.83	1	.5	.5	18.5
	5.00	11	5.5	5.5	24.0
	5.17	1	.5	.5	24.5
	5.33	10	5.0	5.0	29.5
	5.50	5	2.5	2.5	32.0
	5.67	13	6.5	6.5	38.5
	5.83	5	2.5	2.5	41.0
	6.00	7	3.5	3.5	44.5
	6.17	3	1.5	1.5	46.0
	6.33	17	8.5	8.5	54.5
	6.50	4	2.0	2.0	56.5
	6.67	9	4.5	4.5	61.0
	6.83	6	3.0	3.0	64.0
	7.00	10	5.0	5.0	69.0
	7.17	7	3.5	3.5	72.5
	7.33	12	6.0	6.0	78.5
	7.50	2	1.0	1.0	79.5
	7.67	9	4.5	4.5	84.0
	7.83	1	.5	.5	84.5
	8.00	13	6.5	6.5	91.0
	8.17	3	1.5	1.5	92.5
	8.33	6	3.0	3.0	95.5

	8.67	5	2.5	2.5	98.0
	8.83	1	.5	.5	98.5
	9.00	1	.5	.5	99.0
	9.17	1	.5	.5	99.5
	9.33	1	.5	.5	100.0
	Total	200	100.0	100.0	

TotalM

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.67	1	.5	.5	.5
	3.00	1	.5	.5	1.0
	3.33	2	1.0	1.0	2.0
	3.67	2	1.0	1.0	3.0
	4.00	6	3.0	3.0	6.0
	4.33	2	1.0	1.0	7.0
	4.67	6	3.0	3.0	10.0
	5.00	10	5.0	5.0	15.0
	5.33	14	7.0	7.0	22.0
	5.50	1	.5	.5	22.5
	5.67	7	3.5	3.5	26.0
	6.00	10	5.0	5.0	31.0
	6.17	1	.5	.5	31.5
	6.33	15	7.5	7.5	39.0
	6.50	1	.5	.5	39.5
	6.67	10	5.0	5.0	44.5
	6.83	2	1.0	1.0	45.5
	7.00	13	6.5	6.5	52.0
	7.17	4	2.0	2.0	54.0
	7.33	23	11.5	11.5	65.5
	7.50	1	.5	.5	66.0
	7.67	21	10.5	10.5	76.5
	7.83	1	.5	.5	77.0
	8.00	15	7.5	7.5	84.5
	8.17	4	2.0	2.0	86.5
	8.33	8	4.0	4.0	90.5
	8.67	7	3.5	3.5	94.0
	8.83	1	.5	.5	94.5
	9.00	5	2.5	2.5	97.0
	9.17	1	.5	.5	97.5

	9.33	4	2.0	2.0	99.5
	9.67	1	.5	.5	100.0
	Total	200	100.0	100.0	

TotalN

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.67	1	.5	.5	.5
	3.00	1	.5	.5	1.0
	3.33	2	1.0	1.0	2.0
	3.67	3	1.5	1.5	3.5
	4.00	3	1.5	1.5	5.0
	4.33	6	3.0	3.0	8.0
	4.67	4	2.0	2.0	10.0
	5.00	7	3.5	3.5	13.5
	5.17	1	.5	.5	14.0
	5.33	15	7.5	7.5	21.5
	5.67	8	4.0	4.0	25.5
	5.83	1	.5	.5	26.0
	6.00	13	6.5	6.5	32.5
	6.17	1	.5	.5	33.0
	6.33	7	3.5	3.5	36.5
	6.50	5	2.5	2.5	39.0
	6.67	12	6.0	6.0	45.0
	6.83	3	1.5	1.5	46.5
	7.00	18	9.0	9.0	55.5
	7.17	3	1.5	1.5	57.0
	7.33	12	6.0	6.0	63.0
	7.50	3	1.5	1.5	64.5
	7.67	14	7.0	7.0	71.5
	7.83	4	2.0	2.0	73.5
	8.00	20	10.0	10.0	83.5
	8.17	3	1.5	1.5	85.0
	8.33	7	3.5	3.5	88.5
	8.50	1	.5	.5	89.0
	8.67	9	4.5	4.5	93.5
	9.00	4	2.0	2.0	95.5
	9.33	6	3.0	3.0	98.5
	9.50	1	.5	.5	99.0
	9.67	1	.5	.5	99.5

	10.00	1	.5	.5	100.0
	Total	200	100.0	100.0	

APPENDIX E: T-TEST RESULT

Group Statistics

	Preschool	N	Mean	Std. Deviation	Std. Error Mean
TotalW	Non-Preschool	91	5.7985	1.35024	.14154
	Preschool	109	6.4312	1.31805	.12625
TotalR	Non-Preschool	91	5.9066	1.42144	.14901
	Preschool	109	6.5229	1.39434	.13355
TotalM	Non-Preschool	91	6.4432	1.44982	.15198
	Preschool	109	7.0321	1.37315	.13152
TotalN	Non-Preschool	91	6.5348	1.50052	.15730
	Preschool	109	7.0214	1.42113	.13612
Academic	Non-Preschool	91	6.1708	1.32541	.13894
	Preschool	109	6.7519	1.29495	.12403

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
TotalW	Equal variances assumed	.129	.719	-3.343	198	<.001	<.001	-.63266	.18925	-1.00586	-.25945
	Equal variances not assumed			-3.336	189.967	<.001	.001	-.63266	.18966	-1.00678	-.25854
TotalR	Equal variances assumed	.000	.999	-3.086	198	.001	.002	-.61634	.19975	-1.01026	-.22243
	Equal variances not assumed			-3.080	190.326	.001	.002	-.61634	.20010	-1.01104	-.22165
TotalM	Equal variances assumed	.734	.393	-2.944	198	.002	.004	-.58889	.20001	-.98330	-.19447
	Equal variances not assumed			-2.930	187.599	.002	.004	-.58889	.20099	-.98538	-.19239
TotalN	Equal variances assumed	.748	.388	-2.351	198	.010	.020	-.48661	.20700	-.89481	-.07841
	Equal variances not assumed			-2.339	187.597	.010	.020	-.48661	.20802	-.89696	-.07626
Academic	Equal variances assumed	.133	.716	-3.127	198	.001	.002	-.58112	.18586	-.94764	-.21461
	Equal variances not assumed			-3.120	190.032	.001	.002	-.58112	.18625	-.94851	-.21374

Independent Samples Effect Sizes

			95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower	Upper
TotalW	Cohen's d	1.33278	-.475	-.756	-.192
	Hedges' correction	1.33785	-.473	-.753	-.191
	Glass's delta	1.31805	-.480	-.764	-.193
TotalR	Cohen's d	1.40672	-.438	-.719	-.156
	Hedges' correction	1.41208	-.436	-.717	-.155
	Glass's delta	1.39434	-.442	-.726	-.157
TotalM	Cohen's d	1.40852	-.418	-.699	-.136
	Hedges' correction	1.41388	-.417	-.696	-.136

	Glass's delta	1.37315	-.429	-.712	-.144
TotalN	Cohen's d	1.45775	-.334	-.614	-.053
	Hedges' correction	1.46330	-.333	-.611	-.053
	Glass's delta	1.42113	-.342	-.624	-.060
Academic	Cohen's d	1.30889	-.444	-.725	-.162
	Hedges' correction	1.31387	-.442	-.722	-.161
	Glass's delta	1.29495	-.449	-.732	-.163

a. The denominator used in estimating the effect sizes.

Cohen's d uses the pooled standard deviation.

Hedges' correction uses the pooled standard deviation, plus a correction factor.

Glass's delta uses the sample standard deviation of the control group.