Doctoral Dissertation

School Dropout at Basic Education Level in Rural Cambodia: A Longitudinal Study

FATA NO

Graduate School for International Development and Cooperation
Hiroshima University

September 2012

School Dropout at Basic Education Level in Rural Cambodia: A Longitudinal Study

FATA NO

A Dissertation Submitted to
the Graduate School for International Development and Cooperation of
Hiroshima University in partial fulfillment
of the Requirements for the Degree of
Doctor of Philosophy

September 2012

ACKNOWLEDGEMENTS

The success of this dissertation owes much gratitude to many helpful people, some of whom I cannot mention by names and one of whom my gratitude would never and ever reach.

First of all, I owe sincere and earnest thankfulness to the people of Japan who, through their government, have granted me the full financial support during the whole study period here. It is impossible for a poor student from a developing country like me to afford high tuition and living expense in Japan, and to carry out the study for four consecutive years.

Second, this dissertation would not have been fully completed, if it had not been for my main supervisor, Associate Professor Hirakawa Yukiko, who has provided priceless advice since the start of this research study in 2007. In the process of writing this dissertation, she patiently read and provided constructive comments on each draft.

I am also truly indebted and thankful to my sub-supervisors, Prof. Ikeda Hideo, Prof. Kuroda Norihiro, Prof. Yamasaki Hirotoshi, and Associate Prof. Shimizu Kinya, who provided me much valuable advice as well as comments. Their constructive comments and guidance started since this study was planned. After the whole dissertation was completed, they continued to play vital roles in sharpening arguments, building coherence of the dissertation, and connecting the two main studies.

I am much obliged to Dr. Kusumi Vasantha Dhanapala, a Post-Doctoral research fellow at Graduate School for International Development and Cooperation of

Hiroshima University, for her kind assistance, supports and advice. She always reminded me of how to manage my time more efficiently and how to meet all scheduled deadlines. Meanwhile, she provided much useful advice on this research project and proofread all my drafts though it was not her responsibilities or tasks.

Mr. Svay Phalla, the head of Provincial Office of Education in Kampong Cham, Cambodia, deserves a big space of this acknowledgement page for all his invaluable assistance, so that the whole process of data collection could be conducted smoothly and fruitfully. He allowed me to carry out my fieldworks though no official letters from the Ministry of Education, Youth and Sports were issued on time.

Furthermore, I really appreciate all sincere cooperation from students, teachers and principals in this study. These are the people that I cannot mention by names, since there are hundreds of them. Without their sincere answers and cooperation, no valuable data would be available for analysis.

Many special thanks go to my Cambodian friends as well as my lab mates and friends in IDEC, who have always dragged me out of my room and reminded me of how to live an enjoyable and healthy life in social gathering. Without their profound care and love, I would find it hard to imagine how miserable, lonely and messy life I would have lead during those hardest times of producing this dissertation.

Last but not least, it is a great pleasure to thank every member of my family. First, I owe a deepest gratitude to my beloved mum, Sum Phally. She has always supported me physically, psychologically and spiritually. She has taught me how to endure all hardship and stand tall all the time until a real success arises, like no

educational institutions which ever have educated me. Special thanks also go to my elder brother, No Migy, who always assists me personally as well as helps me collect data for this research. Without his assistance, no valuable large-scale data could be obtained for analysis. Especially, I have no means repaying all the kindness to my eldest sister No Monika, who had left school in order to give her younger brothers the chances of higher education and later passed away of intestinal cancer. That was the only reason why my interest in this subject area '*school drop-out'* was stirred up. Though she had left me and my family seven years already, her love and care remains with us beyond time and space. Finally, I would like to thank my three nephews for the jokes and fun they have given me when I was all alone away from home.

Hiroshima University, September 2012

Fata No

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Statement of Problems

Historically, school drop-out was considered as a norm. Educators and policy makers placed far more emphases on how to get children to school than how long those children would stay in school. The concern over it was a relatively recent issue (Shannon & Bylsma, 2006) when its negative effects turned to be apparently visible. In America, for instance, the term "*dropout*" first surfaced in the early 1900s but did not become the "*dominate term*" until later in the twentieth century (Dorn, 1996). It was when a number of studies on school drop-out started to exist. For example, *Laggards in Our School,* by Ayres in 1909, was an early study of dropout and non-promotion in elementary schools, followed by *When Youth Leave School* by Eckert and Marshall in the 1930s (Shannon & Bylsma, 2006). Those concerns flowed from well-developed nations to the third nations. Finally, this educational problem fully captured a global attention in 1948 when most nations pledged to provide each of their citizens the basic education of high quality free of charge, as stated in the Universal Declaration of Human Rights. The declaration had brought the term c*ompulsory education* to many countries' education policies. As mentioned earlier, the commitment to providing basic education to all children resulted from the drawbacks that the drop-out has caused. Until recently, school drop-out is considered problematic from three different perspectives, namely its effects on individual income and economic growth, social expenditures and EFA goal disruption.

1.1.1 Effect of Drop-out on Individual Income and Economic Growth

Undeniably, education is a fundamental survival necessity for each individual in any society. It is widely recognized that education helps boost the economic growth of a nation. Their relationship had been long proved by a famous political economist Adam Smith (1776) in his work "*The Wealth of Nations*", which has much influence on a modern human capital theory that places significance of education and training on promoting each individual's income level and the national economic growth as a whole. Short years of schooling, resulting from high dropout rates, mean big impediments to socioeconomic growth of a country.

Leaving school early means slimmer chance of obtaining high income at individual level. Peng (1985), for instance, firmly postulated that high school students who left their academic career earlier tended to have higher unemployment rates and earn less in the later stages of lives. The effect of educational attainment on incomes, however, was not so pronounced a century ago, but it becomes strongly marked at the present time. A recent study showed that the income difference between the middle-age high school dropouts and college graduates in the United States was around 30% in 1949; however, the difference gap has been enlarged to over 150% (Stringfield & Nunnery, 2010). The sharp income difference between high school dropouts and college graduates are clearly visible in developed nations, let alone the difference between primary school dropouts and university graduates in developing nations. In his study on income inequality and education levels, Sylwester (2003) robustly ascertained that enrolment in higher education produced much difference of income inequality in less developed countries while it was not significant in

OECD countries. From his finding, it can be concluded that the education, in developing nations, plays more vital roles in explaining the gap between the rich and the poor.

1.1.2 Social Costs of School Drop-out

Not only does school drop-out cause a great reduction in each individual income level, but it also ignites many social problems and financial wastage for the government. In a place where many of adolescents stay out of school, high rates of mortality, crime and other antisocial behaviors are inevitable (Rumberer & Lim, 2008). That forces the government to raise much expenditure for social welfare. On a different side of the same coin, high dropout rates represent decreases in amount of annual taxes collected by the state. Belfield and Levin (2007) estimated that the US government would gain more than USD 200,000 from the tax paid by a dropout if s/he could graduate from high school. However, if they make early school departures, the government needs to subsidize for their poor health and high crime rates. Furthermore, on education policy implementation side, a large number of dropouts may distort the normal instruction, which results in higher cost of realizing the set goals of the policies (Hanushek, Lavy & Hitomi, 2006).

1.1.3 Drop-out as Disruption for EFA Goal Realization

Another reason for concern about drop-out comes from the country EFA targets. It is generally easy to gather children into school, but it is tedious to keep them until a completion of a certain level of education, say primary school. In developing countries, for instance, after some policies, say *school fee abolition*, have been implemented, the gross enrolment rates (GER) usually rise over 100% nationwide. The commonly sad facts, however, are that a sizeable percentage of them stay in school for few years and then make

school departures before a completion of the set target level. Notably, drop-out effects are intergenerational. Dropped-out parents tend to have low educational aspiration for their children and devalue the importance of education. That puts greater risks on their children's education. Short periods of education for their children are inevitable outcomes. If it is not handled properly in a timely manner, its cycle continues to repeat and prolongs a country's EFA goal realization.

By realizing the importance of education and acute problems caused by dropout, many international organizations have been working closely with each individual government of a developing nation to endure an equitable access to the quality education for all. Those efforts can be witnessed by the appearances of many recent joint-commitment statements, such as Convention on the Rights of the Child in 1989, the 1990 World Conference on Education for All in Jomtien, Dakar Framework for Action in 2000, and later the Millennium Development Goals (MDGs), where all nations pledged to achieve universal primary education for all by 2015.

The Royal Government of Cambodia (RGC), of no exception, has placed a great emphasis on education as a major tool for social and economic development of the country. After the first national election backed by the United Nations in 1993, RGC has committed itself to achieving universal nine-year basic education by 2015. The success has been shown in a remarkable increase in both gross and net enrolment rates at basic education level (Overseas Development Institute, 2010). In 2010, the gross enrolment rates for primary school (grades 1-6) and lower-secondary school (grades 7-9) were 117.9% and 59.1% respectively, whereas the net enrolment rates were 95.8 % for primary school level

and 33.0% for lower-secondary school (Cambodian Ministry of Education, Youth and Sport [MoEYS], 2011). However, school dropout remains an unsolved problem in the Cambodian education system, which has hindered the realization of EFA goals by 2015. For instance, the average dropout rate for each grade in primary school level was 8.7% and it soared up to 19.6% in lower-secondary school level (MoEYS, 2011). It was estimated that only 36.1% of Cambodian students who enrolled in schooling could reach grade nine and this low survival rate put the promised EFA commitment of the RGC into a fallacy.

1.2 Significance of the Study

Though drop-out was long proved harmful for human beings, little attention has been paid to it in Cambodia. First, there is no single special institution ever established to tackle this problem independently. In the United States, for instance, though drop-out only matters in upper secondary school, a national dropout prevention center was established in 1986. That center has been working cooperatively with the government and school districts to provide preventive policies to reduce high school dropout rates, based on its empirical evidence. Even though the RGC has implemented many policies to heal dropout problems, for example scholarship program, school readiness, and so on, they worked in a short run due to the lack of consecutive efforts in preventing this problem. The drop-out rates, thus, remain fluctuating throughout the last decade. Second, few studies most of which relied on the opinions of the dropouts and their families or used retrospective data were available in Cambodia. In those studies, poverty and child labor were found to be the major contributing factors on drop-out. Historically, never has school drop-out been investigated longitudinally in Cambodia. Since 2005, no studies have been further conducted to gain a clearer picture

of this educational wastage phenomenon.

This project revisited the drop-out problem in Cambodian primary and lower-secondary schools to clarify its influential factors and to gain deeper insights into its phenomenon, using a different method called *survival* or *event history method*. This method allows researchers to observe patterns of occurrence, compare those patterns among groups and model their analyses over time (Willet & Singer, 1991). It is one of the most appropriate methods for quantitative studies on school dropout, because drop-out is a dynamic process, rather than an event (DesJardins, 2003). In fact, it is caused by accumulation of experiences and events before a decision of dropout is finally made. Such a study that observes these changing patterns is of a great value for policy application; for it can help identifying at-risk students earlier so that some kinds of treatment can be provided on time to reduce the dropout rates. Unlike most studies, it hypothesizes that the root causes of dropout vary from grade to grade. The reasons why seventh-graders leave school are not same as the ones found from the first-graders. For instance, the grade-seven students might leave school to help their parents earn living, but the first-graders cannot be of much help on this matter. Failing to recognize such differences, hence, means least opportunity to understand a nature of school dropout, which drives policy makers to ineffectively intervene on this problem. It, lastly, examines this educational wastage phenomenon more objectively without pooling data from the dropouts *per se* and their families.

Globally, this study possessed one unique characteristic, in comparison with most of the studies employing this method. Generally, due to the high cost and long time that a researcher needs to spend collecting survival data, they used the available data that

were collected for other purposes, rather than for dropout itself. This limited their analyses over some specific areas of dropout predictors. The behaviorists who were interested to seek for the relation between some kinds of youth behaviors and dropout possibility used the survey data pooled for the adolescents' misbehaviors. They then structured their analyses over this aspect. Similarly, psychologists looked solely at the psychological factors of individual students and their families in relation with drop-out decision. It can however produce misleading results if any research study fails to control for the influences from other significant predictors as Chen and DesJardin (2008) postulated. In developing country contexts where panel or longitudinal data were not so common or available, little was the empirical evidence from this world. This study however was designed to investigate insightful events of school drop-out by including most of its significant predictors. The data were collected personally by the researcher over the period of four years.

1.3 Purposes of the Research Studies

The whole research aimed at identifying the factors contributing to school drop-out of the rural Cambodian students at basic education level. It consisted of two studies.

The first study looked at dropout at basic education in rural Cambodia longitudinally by including three different cohorts of sample. Its main purposes were (a) to reveal what forced rural Cambodian students to leave schooling early and (b) to check whether there were common or different causes of school dropout by the earlier and later grades of basic education.

The second study, using the first and fifth-grade sample students of the main and new sample students from another rural province, was to seek for the causes of school drop-out in different provinces. Its main purpose was to investigate how much the findings from the main study can be generalized to other rural settings in Cambodia by comparing and contrasting the findings of the two rural provinces.

Table 1.1. **The main purposes of each study**

Study	**The main purposes of the study**
The First Study	● To explore what force rural Cambodian students to drop out at basic-education level ● To observe the differences between the causes of dropout from the three different cohorts (Earlier grades of primary schools, Later grades of primary schools, All grades of lower secondary schools)
The Second Study	● To investigate how much the findings from the main study can be generalized to other rural setting in Cambodia

1.4 Definitions of Key Terms

One of the main challenges for those who are interested in dropout study is its structural complexity in different contexts, which make an attempt to define its clear universal definition impractical. OECD (2002) defines a “dropout” as a student who leaves a specific level of education system without achieving the first qualification. UNESCO (2005) states that “dropping out” or “early school leaving” is the act of leaving without completing the started cycle or program. However the most well-known definition is the

one provided by Morrow (1987, p.353). He operationally defines a "dropout" as any student who has been previously enrolled in a school, who is no longer actively enrolled as indicated by fifteen days of consecutive unexcused absence, who has not satisfied local standards for graduation, and for whom no formal request has been received signifying enrollment in another state-licensed educational institution. A student death is not tallied as a dropout.

In Cambodia, there has been no clear operational definition of dropout. The dropout rate is defined by the use of formula: *Dropout rate = Enrollment rate – (Promotion rate + repetition rate)* (MoEYS, 2007). This formula disregards the out-of-school children and it also counts those who transfer from one school to another as dropouts. There is no doubt that in some schools the dropout rates are very high, while in some other schools, the dropout rates carry negative value, for example, - 45 %. Using this formula, student death also is counted as dropout.

In this research, the definition of dropout is adopted from No (2009) with some changes and new criteria were added to make it suitable for a longitudinal study. A dropout[1], thus, is any student who:

- has been consecutively absent for 30 days without any formation notice or reason informed to their homeroom teacher or school;
- has left school or been kicked out of school and has not been registered in any other officially recognized school;

[1] Throughout the dissertation, the term *dropout* will be used frequently. When it is an uncountable noun, it refers to the act of dropping out of school. When it is a countable noun, it means a child or student who leaves school earlier.

- is reported by 95% of their classmates that they discontinued their study[2];
- stops schooling for one year and never returns next year or any time before the observation period is closed.

Student death is not counted as a dropout and the students who transfers from the enrolled schools to other schools with formal notification to school are not considered as dropouts, either.

Another key term needed to be defined is *basic education*. This term was widely used in the 1990 EFA declaration. There were, afterwards, heated debates over its definitions and standard measures to mark EFA achievement of each member country, since *basic education* is defined differently from one country to another. This term was no longer in use from the very next world EFA declaration. In Cambodia, it exists everywhere as long as education is concerned, such as in the national policy, education laws, and so forth. This *basic education* means "education provided from grade 1 to grade 9" or in the other term "education provided from primary school level to the end of lower-secondary school level." This study simply follows these definitions.

1.5 Organization of Dissertation

The whole dissertation is segmented into eight main chapters. Chapter 1 highlights the significance and states purposes of the research. It also defines two important key terms to facilitate readers' understanding. Chapter 2 looks at the achievements and

[2] In Cambodia, the educational budget is allocated to school based on the number of students in that school. If there are more students, the school is supposed to receive more funding. That is why some schools still keep students' names in list though they dropped out already.

challenges of implemented policies in Cambodia during the last two decades. Chapter 3 reviews major related literature in both developed and developing countries, studies the trends of the studies employed event history method and finally sets a model specification for the whole study. Chapter 4 introduces a separate methodology of the study, which covers the sampling process, research instrumentation, analysis data, analysis tools and so on. The next chapter introduces the main findings from the first study while chapter 6 describes the differences and similarities of the findings from the two rural areas separately. It also continues to state to what extent the findings from the first study could be generalized to other rural setting. Chapter 7 discusses the findings from the two studies so that the compromised agreements among those findings can be reached. The last chapter wraps up the whole research and ends with some limitation statements and suggestions for prospective studies.

CHAPTER 2

GENERAL EDUCATION IN CAMBODIA:

ACHIEVEMENTS AND CHALLENGES

To understand a single issue of educational problems without having understood an overall context where it stands is somehow misleading. Hence, this chapter is deemed necessary to come into existence in order to highlight a history of educational development in Cambodia. It then continues to describe the achievements the RGC has done so far, and the remaining challenges that need to be addressed so that its promises could be fulfilled.

2.1 A Brief History of Modern Education in Cambodia

History of modern education in Cambodia started very recently. It was not until early 1900s when the French protectorate introduced modern education to replace traditional Buddhist schooling (Clayton, 1995; Dy, 2004). The main purposes of this introduction were to create few well-educated elites to help work for the protectorate; that was why very small percentages of students enrolled in the so-called modernized primary and lower secondary schools. After gaining independence from France in 1953, King Sihanouk put much emphasis on education as a mechanism for the socio-economic development of the country. Built on the bases that were left behind by France, many education reforms were initiated and implemented, and the progress was very impressive. The enrollment rates to primary and lower secondary schools increased drastically. More than 160,000 children were enrolled in schooling nationwide (Kiernan, 1985). During the

1960s, the government spent more than 20% of national expenditure budget on education (Dy, 2004). It was the time when Cambodia was a very prosperous country in Asia.

The enjoyment of political stability and prosperity did not last long. In 1970s, civil wars broke out all over the country, which put progress of education expansion into a halt. Due to security concerns, many schools were closed during General Lon NoL's administration (1970-1975), which was backed up by the US government. A handful of schools were destroyed by heavy bombardment. Education and development were taken place only in urban areas.

More severely, the dark years (1975-1979) in Cambodian history came into existence, when General Lon Nol was overthrown. The period was generally known as Year Zero, where all kinds of development stopped completely. With its radical social reform strategies, that administration believed that to advance agriculture was the only way to bring back prosperity to the country. Hence, the Cambodian people were evacuated out of the capital city and urban areas to do collective farming in rural areas. To respond to this notion, the Cambodian children were taught very rudimentary education in the factories or cooperatives (Duggan, 1996). They were indoctrinated to love *Angka* [3] and to whole-heartedly work for this organization. Schools were completely closed and used as storages for agricultural tools and products. During its four years of administration, more than two million people were starved to death or executed. People who spoke foreign languages or were reported to be well-educated were indiscriminately slaughtered (Collin, 2009).

[3] *Angka* was the name widely used to call the administration led by Pol Pot (1975-1979)

2.2 Education Reforms After 1979

After gaining victory over the genocidal administration, a new government under an occupation of Vietnam made great efforts to reinstate its own education system with very limited remaining human resources. With assistance from Vietnam, schools started opening again (Collin, 2009; Dy, 2004). There were a few literate people to fulfill teaching and administrative positions. Owing to such a great shortage of educated manpower, this country adapted a maxim '*those who know little teach those who know nothing'*. It was estimated that 5,000 primary schools were run to provide education nationwide and there were around 21,000 primary school teachers by 1980 (Duggan, 1996). A 10-year education system (4+3+3) was launched in order to rapidly build human resources to place in many vacant positions in the country[4]. Later in 1986, when some of vacant positions could be fulfilled, the Cambodian government extended its system to 11 years (5+3+3). That reform was to raise the quality of primary education.

It should be noted that education system in Cambodia was modeled on communist bloc and most of Cambodian elites and intellectuals were granted scholarship or officially sent to study in Russia, Cuba, Vietnam, etc. Foreign languages, rather than Russian and Vietnamese, were completely forbidden, during Vietnamese occupation (1979-1989).

The Jomtien World Conference on Education For All marked new changes in education development in Cambodia. The first EFA plan was given birth in 1991. After 1993 UN-sponsored national election, there saw much improvement over education system

[4] Duggan (1996) stated that between 75% and 80% of well-educated Cambodian were killed and sought for asylum in other countries.

itself. Though an absolute peace was not guaranteed in the entire country, education started spreading to the remote parts. The government promised to provide basic education to all its citizens. According to Article 68 of the Cambodian Constitution proclaimed in 1993, "the state shall provide free primary and lower secondary education to all citizens. Citizens shall receive education for at least nine years." This promise was reinforced by the Education Law, which was enacted in December 2007. It states that every citizen has a right to the quality education of at least nine years' duration in public schools free of charge and the ministry in charge of education shall prepare policies and strategic plans to ensure the EFA goals as stipulated by the law. In 1996, the basic-education level was lengthened to 9 years, which resulted in the present 12-year education system (6+3+3). (See Appendix A for the Cambodian education system.)

A new chapter was opened for the Cambodian poor and remote children, at an onset of this millennium. In 2000, RGC launched the Priority Action Program (PAP) in ten provinces in Cambodia. The program was intended to reduce families' schooling expenses. In 2001, the program was enforced nationwide and the whole general education became free for all Cambodian children. Many school-age children were attracted to school, once it was fully implemented. Keng (2009) noted that this policy triply increased the enrollment rates of the remote children. More efforts and emphases have been placed on education. For example, with much technical support from UNESCO, the Cambodian government developed its first-ever long-term EFA national plan, which was first launched by MoEYS in 2003 (Bredenberg, 2008). The plan was supported by many policies and strategic actions, which made EFA plan become more detailed and comprehensive than ever. As shown in

Table 2.1, the education budget share was planned to increase every year to realize the government's promises of providing each citizen free, but of high quality, basic education. This budget plan will increase per-student expenditure from 27USD in 2002 to 46 USD by 2015, as well as teachers' salary pays.

Table 2.1. **Education Recurrent Spending Plan 2001-2015 (Riels in millions)**

Years	2001	2005	2010	2015
Primary policy financing scenario	256,876	487,303	783,996	963,703

Source: National EFA Plan 2003-2015

Note: 4000 Riels = 1 USD (the exchange rate on 12 April, 2012)

2.3 Achievements and Challenges

2.3.1 Educational Access

Over the last two decades, much achievement has been made on access to education. More schools were built and conditions of old schools were improved. As mentioned in the previous section, in 1980 there were only 5,000 schools under operation. By 2011, around 8,747 schools were running to provide general education. Figure 2.1 depicts a sustainable progress of physical expansion at all levels of education. During these last 14 years, the number of lower secondary and upper secondary schools tripled, from 467 in 1997-98 to 1573 in 2010-11 for lower secondary and from 125 to 407 for upper secondary level. Though the rates of increase for primary school levels were not as high as for secondary schools, physical conditions of schooling buildings were renovated and more classrooms were established on old school sites.

The dramatic growth of schools was consistent with a large increasing number

of enrolled children. An introduction of school fee abolition in 2000 drastically raised GER and NER in general education. Its impact was so marked at primary level. According to EMIS data (2001 & 2002), GER and NER of primary schools rose from 109.8% and 83.7% in 2000-01 to 125.1% and 87.0% in the next academic year respectively. Primary school NER continued to grow gradually. It reached its peak of 95.2% in 2011. This marked a great effort of RGC to absorb all school-age children into school at the required age. Figure 2.4 informs an overall increasing trend in GER of lower-secondary schools. In 1998, lower secondary school GER was about 23.7%; however, it increased to its climax of 63.8% in 2007-08. Subsequently, it started to decrease again. Until 2011, it declined to only 58.5%. NER of this level also doubly increased during these last 14 years. A sizeable improvement could be observed at upper-secondary level. The GER rose fourfold while NER increased threefold in the last two decades.

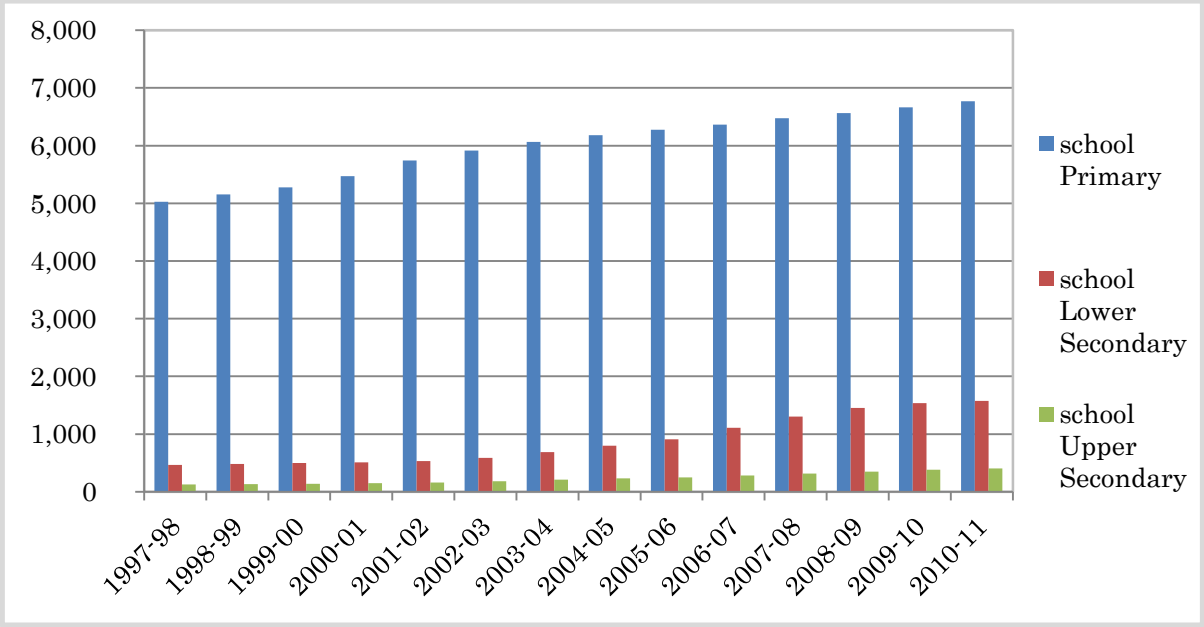


Figure 2. 1. **Total numbers of schools at all level from 1997-98 to 2010-11**

Sources: EMIS, Education Statistics & Indicators 1998-2011

Though GER and NER markedly increased, many tasks have still been left behind. By observing data from Cambodian Household Survey in 2004, Benveniste, Marshall and Araujo (2008) ascertained that there were large differences between completion rates of rural poor and urban rich students (also Dadloe et al., 2007). The gaps were so slim in the first four grades of primary schools. They started to enlarge from the later grades of primary school to the end of general education. Meanwhile, around 10% of school-age children never attended primary schools (Bredenberg, 2008). Those children were mainly residing in remote minority communities. At lower secondary level, it was even more serious. Only 35% of required school-age children enrolled in lower secondary schools, which distracted the full realization of universalizing basic education (MoEYS, 2011). Figure 2.3 indicates that until recently those students who enrolled in primary level had about 60% of possibility to complete primary schools. This lower percentage of completion rates resulted from high dropout rates of almost 10% in every grade. It was far more serious when students reached lower secondary schools. More and more students started to leave school every year with the rates of 20% or more in every grade (see Figure 2.4). It could be assumed that less than 25% of students who started schooling were able to complete basic education. This rate was too low. It is a good reminder to the Cambodian government to properly handle the drop-out problem. Much success has been gained on efforts to gather children to school but keeping them in school until completion of basic education remain a big challenge for RGC.

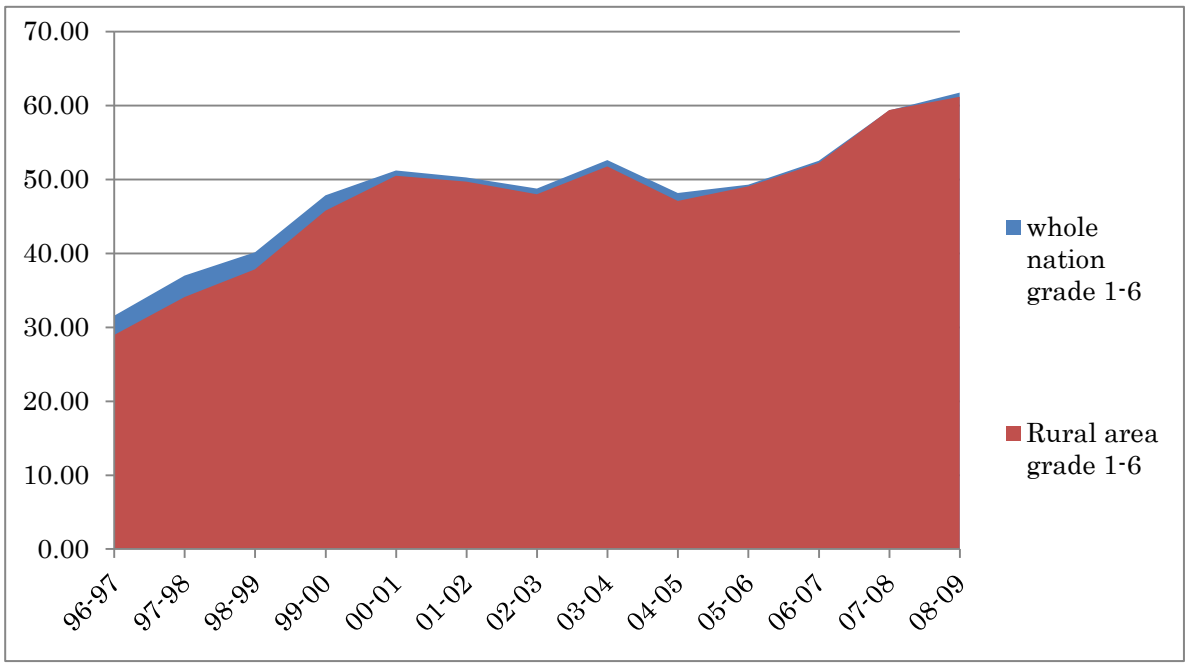
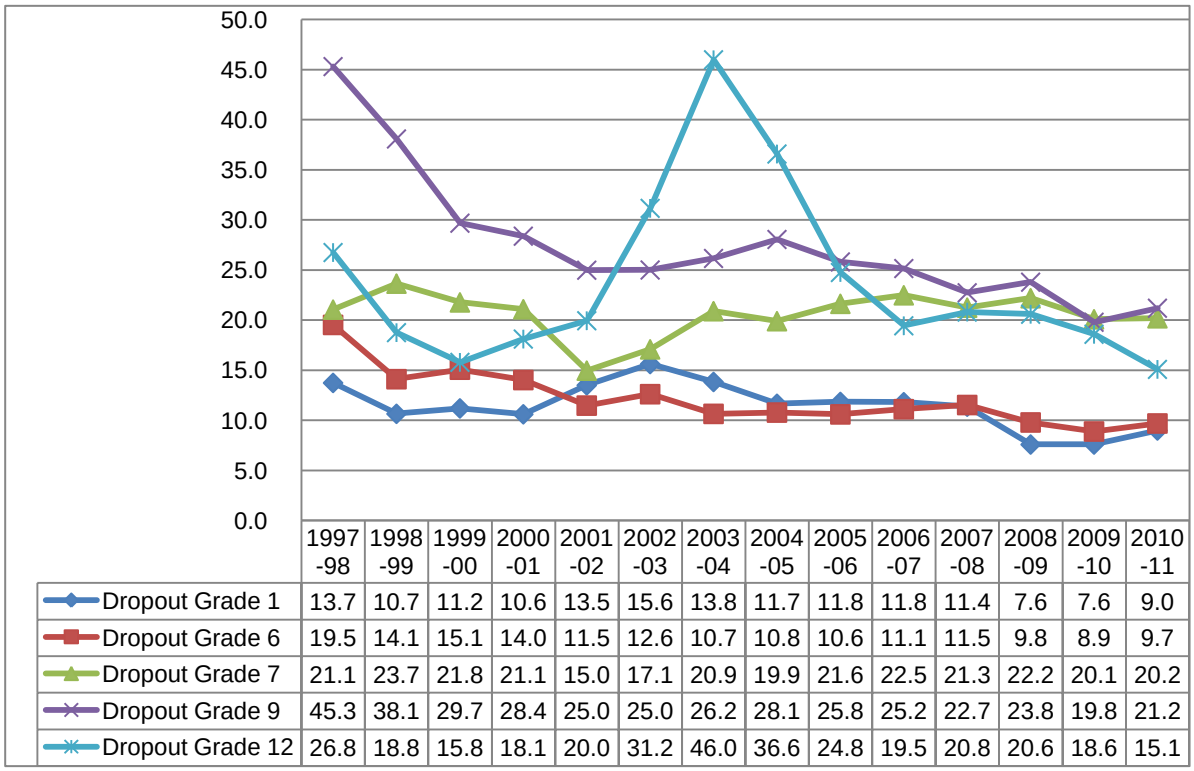


Figure 2.2. **Survival rates from grade 1 to grade 6 from 1996-97 to 2008-09**

Sources: EMIS, Education Statistics & Indicators 1998-2011



	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Dropout Grade 1	13.7	10.7	11.2	10.6	13.5	15.6	13.8	11.7	11.8	11.8	11.4	7.6	7.6	9.0
Dropout Grade 6	19.5	14.1	15.1	14.0	11.5	12.6	10.7	10.8	10.6	11.1	11.5	9.8	8.9	9.7
Dropout Grade 7	21.1	23.7	21.8	21.1	15.0	17.1	20.9	19.9	21.6	22.5	21.3	22.2	20.1	20.2
Dropout Grade 9	45.3	38.1	29.7	28.4	25.0	25.0	26.2	28.1	25.8	25.2	22.7	23.8	19.8	21.2
Dropout Grade 12	26.8	18.8	15.8	18.1	20.0	31.2	46.0	36.6	24.8	19.5	20.8	20.6	18.6	15.1

Figure 2.3. **The flow of dropout rates in some selected grades**

Sources: EMIS, Education Statistics & Indicators 1998-2011

2.3.2 Education Quality

If the quality of education can be measured by promotion and repetition rates, as claimed by MoEYS (2004), a great reduction of repetition rates and an impressive increase in promotion rates were clearly evident. With reference to Figure 2.4, the repetition rates for grade one were greatly fluctuating with a very high starting rate of about 40% in 1998, but it turned to be 13.5% in 2011. The rates were reduced three times during these last 14 years. Interestingly, the rates in grades 6 and 7 were steady, around 5% each year. In 2011, repetition rates of all grades steeply declined. From grade 6 onwards, the rates became less than 5%, though it was supposed to be high at the last grades of lower and upper secondary levels, where national exams were conducted to screen out students' academic performance requirements for graduation. However, repetition rates remain high in the first few grades of primary school, especially in grades one and two.

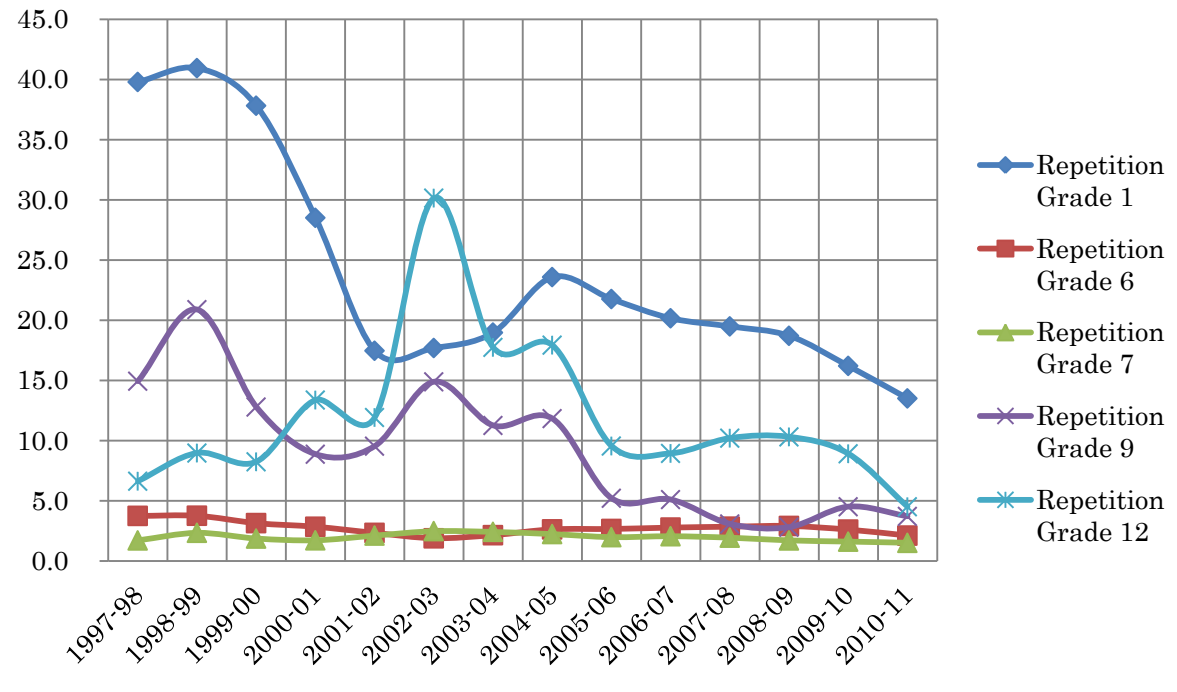


Figure 2.4. **The flow of repetition rates in some selected grades**
Sources: EMIS, Education Statistics & Indicators 1998-2011

So far Cambodia has mainly been in pursuit of education system expansion, focusing on attracting more children to school and building physical infrastructures for education. Little attention has been paid on quality of education provided inside school. As a result, much improvement could be only observed with *access* domain. The most intended outcome, however, is how much students have learnt once they are in school, not how many of them pass or repeat grades. Leaving their homes and being at school every day did not guarantee that they learnt necessary knowledge and skills for survival at later stages of their lives at all. Measuring the actual achievement levels of students was a daunting task and has thus received less attention. MoEYS confessed that there were no national data available to measure actual achievement of students, which objectively reflected a real quality of education in Cambodia (MoEYS, 2005).

Most educators who were interested in studying the quality of education in Cambodia agreed that Cambodia is facing an acute problem with low quality of the education provided (Bernard, 2005; Bredenberg, 2004; Wheeler, 1998). High pupil-teacher ratios, high student-class ratios, limited hours of instruction, and poorly trained teachers were reported as the main challenges leading to low quality of learning, repetition and dropout (MoEYS, 2005). In their study on teachers' profession in Cambodia, Beneveniste, Marshall and Araujo (2008) found that three quarters of primary school teachers received education at lower secondary school or lower. Though most teachers completed short pre-service training, in-service training and professional development workshops were scarce in Cambodia. They also discovered that on their surprise visits to the public schools, 15.6% of lower secondary teachers were absent while the rate of primary school teachers

was just 7.1%. Generally, attendance rates of teachers are strongly correlated with the rates of students. That results in fewer teaching and learning hours. Hence, though there have been no nationwide tests to measure actual achievement of Cambodian students, on a condition of limited hours of instruction time, and poor levels of teachers' content and pedagogical knowledge, the knowledge the students have received must be much lower than the intended knowledge that the government intends to provide.

Standard tests given to around 7,000 third-graders and sixth-graders showed that over 60% of grade-3 students were categorized as *very poorly* and *poorly performed* students. They had many problems with the two main subjects, Khmer and Mathematics. Most of them could not even solve very rudimentary arithmetic. However, the achievement levels of grade-six students were much higher in comparison with the former group. Given the fact that students started to drop out heavily in later grades of primary schools, it was generally believed that a large percentage of slow learners were reduced on the way. The remaining percentage could therefore be, more or less, considered as highly achieving students. The relationship between dropout and low levels of educational achievement was proved to be real in many studies (e.g. Abrams & Haney, 2004; Jimerson et al., 2005; King, Orazem & Paterno, 2008; Maani & Kalb, 2005).

2.3.3 Educational Equity

The education reform efforts in Cambodia has brought much satisfactory results in closing gender disparity gaps both in remote and rural areas (Keng, 2009). Figure 2.5 shows that the gaps between NER of boys and girls were almost met since 2004-05, and they continued to be smaller and smaller. The NERs of boys and girls at primary and

upper-secondary levels were almost the same, with gender parity index (GPI) of 0.99 in both levels. Surprisingly, more girls (GNI= 1.13) were enrolled into lower secondary schools than boys in 2010 (MoEYS, 2011). A little difference can be observed in GER. At upper secondary level, the gap was largely widened to a disparity of 2.8 percentage points over a total rate of 32.9%. The 2010 GNI at this level was just 0.84.

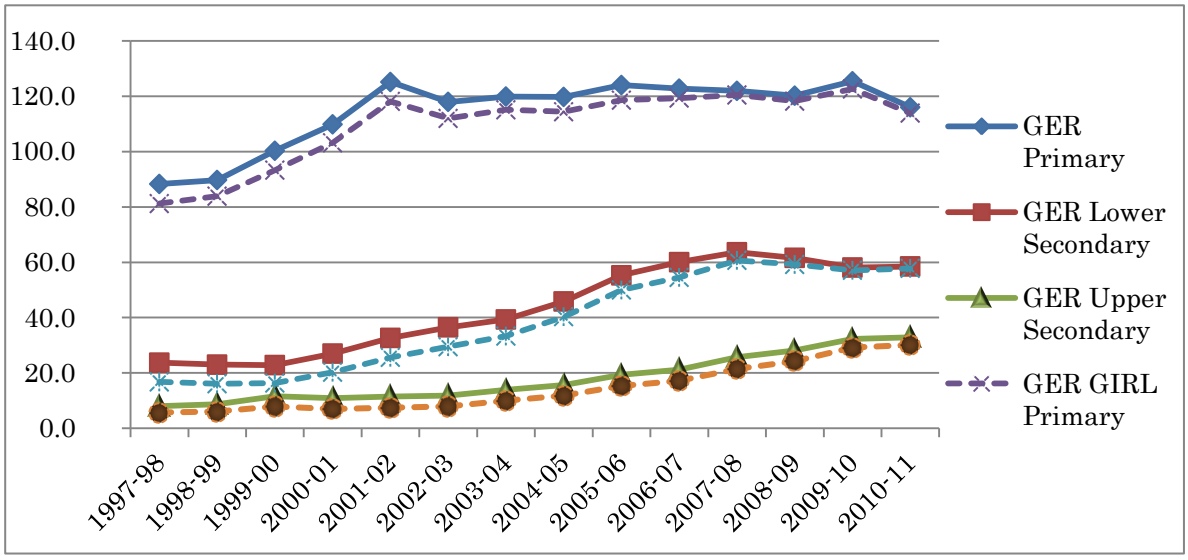


Figure 2.5. **Total gross enrollment rates in comparison with girls**

Sources: EMIS, Education Statistics & Indicators 1998-2011

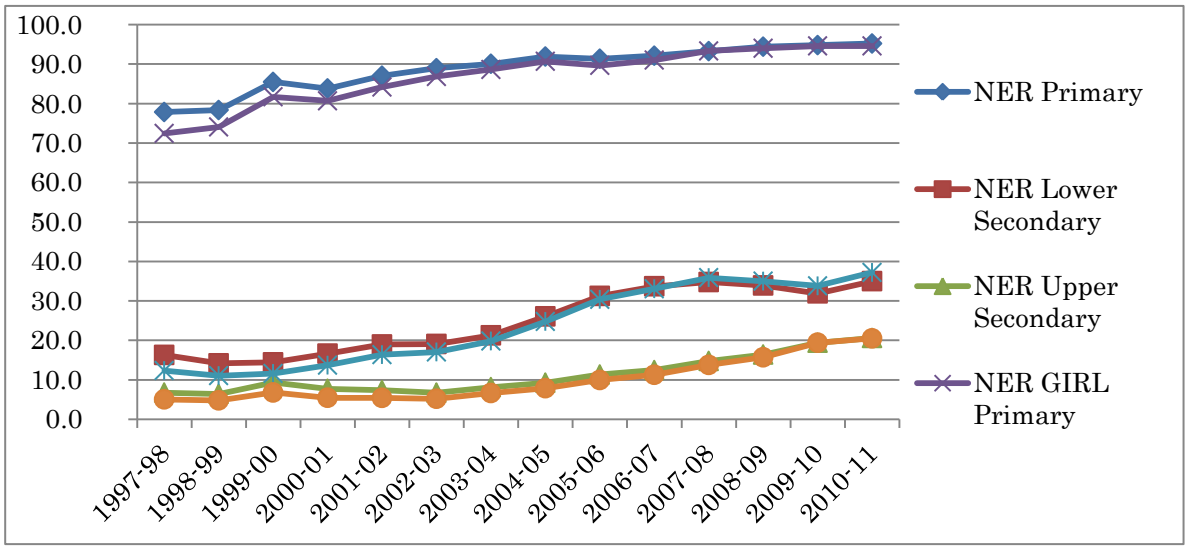


Figure 2.6. **Total net enrollment rates in comparison with girls**

Sources: EMIS, Education Statistics & Indicators 1998-2011

Children from minority and vulnerability groups remained left underserved (Bredenberg, 2008; UNESCO, 2007). Enrollment and drop-out rates varied by geographical locations. The dropout rates for some economically prosperous areas, such as Phnom Penh and Kandal, were relatively low, compared to some remote areas like Mondul Kiri and Ratanak Kiri. According to the very recent statistics from MoEYS (2011), it was estimated that dropout rates for primary students in Phnom Penh and Kandal were 5.4% and 5.1%, while they soared up to 17.3% in Mondul Kiri province and 13.8% in Ratanak Kiri. Most of the provinces where dropout rates were reported very high and GER but NER were low are located in remote areas where minority and less economic advantaged groups are residing.

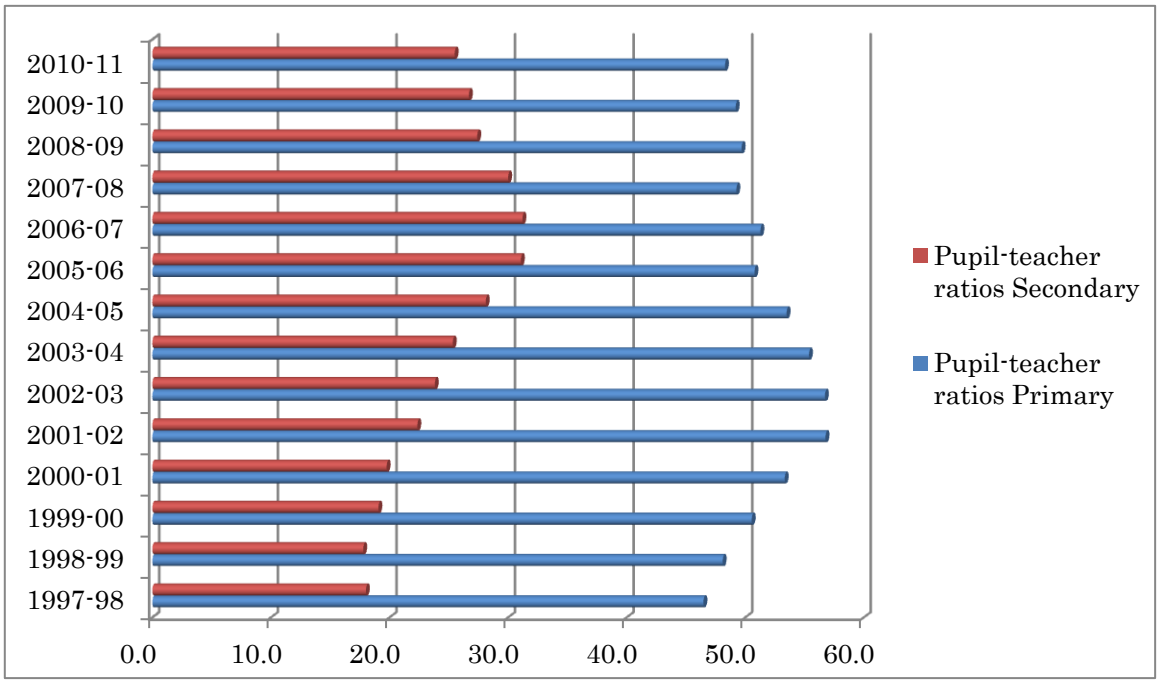


Figure 2.7. **Countrywide trends of pupil-teacher ratios between 1997-98 and 2010-11**
Sources: EMIS, Education Statistics & Indicators 1998-2011

With regard to teacher deployment, it was reported that more and more teachers have been recruited and deployed to underserved areas. Because of a flexible policy of the government that allow the students from the communities where upper secondary school were scant to take part in teacher training course, though they possess only lower secondary school certificates, many teachers were trained and sent back to serve their communities (Overseas Development Institute[ODI], 2010). This policy reduced a great number of contract teachers and lowered pupil-teacher ratios, at large extent. Overall, pupil-teacher ratios almost met the standards set by MoEYS. As a principle, the ratios are 45 and 40 for basic education and upper secondary education respectively (MoEYS, 2004). Figure 2.4 shows that, by 2011, the set standards were almost realized at primary school cycle, around 48.3, while at secondary level, it was much lower – 25.5.

Though an overall trend showed a great achievement of teacher deployment in Cambodia, much difference between the ratios of urban, rural and remote segments remains huge. Breaking down the whole EMIS data by areas, Beneveniste, Marshall and Araujo (2008) and ODI (2010) found that urban and suburban areas enjoyed very low ratios whereas the remote areas were always in shortage of trained teachers. Contract teachers were very common in those far-flung disadvantaged areas, where urban and suburban enjoyed surplus of teachers for administrative work.

CHAPTER 3

REVIEWS ON DROPOUT STUDIES AND THE MAIN RESEARCH FRAMEWORK

This chapter will first introduce the global evidence of why children are not in school. It then continues to highlight the available empirical evidence in the Cambodian context before a snapshot of common types of data that are widely used in school dropout research. The second last part will discuss the rise of a new methodological tool that has gained its prominence in this field because of its unique quality to deal with many shortcomings of previous methods. The main analytic framework is drawn based on the reviews of vast literature available, at the end of the chapter.

3.1 Global Empirical Evidence of School Dropout

There are several kinds of theoretical perspectives, such psychological, behaviorist, societal, interactional, economic, organizational, etc., that were formed to study a complex nature of school dropout. These perspectives have shed light on the evolutionary process of this educational problem at every hierarchical level where the problem is nested.

3.1.1 Individual Level

3.1.1.1 Time-Invariant Predictors: Student Background

Usually, students who possess some kinds of unchangeable backgrounds are at risk of ending their educational careers early. Educational inequality theorists always look for relationship among school dropout, student gender and races. Generally they found that girls tended to stay in school shorter than boys (Diyu, 2002; Holmes, 2003; Odaga &

Heneveld, 1995). From birth, in some societies, people value education of boys more than that of girls, for girls are believed to serve their future husbands' family welfares after being married off. Very little empirical evidence showed that girls retained in schooling longer than boys (Mansory, 2007; Open Society Institute [OUI], 2007). In Mongolia, boys help raise their family incomes better than do girls (UNICEF, 2005). It was also proved that students from minority groups were more vulnerable to leaving school earlier than their counterparts from majority groups (Chatterji & DeSimone, 2005; Laird et al., 2007; Roebuck et al., 2004). Minority groups usually reside in rural or remote parts of a country where education-required job availability and public funding are not so high.

Several more predictors on student background domain were cited continually, such age at school entry, preschool experience and poor health condition. By and large, students who were overage for their grades were shown to be at the greater risk of dropping out (Lloyd, Mensch & Clark, 2000; Wils, 2004). In its study on out-of-school children in 15 countries, UNESCO (2005) found out that in nine countries, the majority of children left school when they were three or more years older than expected ending age for primary school education. Generally, those late entrants find themselves difficult in socializing with the young class mates. Plus, the opportunity costs of schooling become large. Next, children who participated in preschool tended to have high completion rates (Barnett, 1995; Reynold et al., 2007). Preschool experience did not only reduce dropout rates but also positively influenced later school performance and well-being of children. Another point was that children who have poor health conditions possess high possibility of leaving school earlier (OUI, 2007).

3.1.1.2 Time-Varying Predictors

3.1.1.2.1 Academic Performance

In this sub-domain, there are two important predictors, grade repetition and academic achievement. Voluminous literature ascertained that children with a higher achievement were more likely to attend school and survived longer in their educational careers (Abrams & Haney, 2004; Bedi and Marshall, 2002; Jimerson et al., 2005; King, Orazem & Paterno, 2008). In New Zealand, Maani and Kalb (2005) convinced that any policy that could improve the academic performance of students by one point of a grade would reduce dropout rates by 4.3 percent. Another main determinant is grade retention. It was clearly evident that grade retention or repetition reduced the likelihood of children's schooling continuation (Andre, 2008; King, Orazem & Paterno, 2008; UNESCO, 2005). More precisely, Grisson and Shepard (1989) stated that grade retention increased dropout rates by as much as 20-30 percent, after controlling for other potential predictors. Surprisingly, in Chicago, testing-based promotion policy that increased repetition rate of eight-graders from 1% to 10% actually lowered later dropout rates (Allensworth, 2004). It was claimed that repetition effectively prepared students for the next grade and raise their achievement in latter grades.

3.1.1.2.2 Behaviors

Behaviorists argue that it is important to observe some misbehavior activities of children since they can inform educational stakeholders of who are at risk of dropping out. Usually, students who were involved in delinquency activities (Chavez & Oetting, 1994; Natriello, 2002) and substance abuse (Farahati et al., 2003; Roebuck et al., 2004; Chatterji

& DeSimone, 2005; TEA, 2006) tended to end their educational careers earlier than the normal students. Practically, such misbehavior activities occur at higher grades of schooling, say high school level. At school or classroom level, teachers or principals can observe two detrimental behaviors that signal the onset of dropout. Much research proved that students who had low class attendance would become less interested in schooling and dropout would be the ending school pathway (Bridgeland et al., 2006; Kennelly & Monrad, 2007; OUI, 2007). Rumberger and Lim (2008) in their review of dropout research in the last 25 years reconfirmed that students who were less involved in class participation, such as homework completion, are at a greater risk of dropping-out.

Social scientists consistently concluded that adolescent behaviors were more influenced by their peers than any other socialization institutions. Youngsters whose friends had already dropped out and engaged in any income-generating work were more likely to drop out of school (OUI, 2007). In their longitudinal study using data from the National Longitudinal Study of Adolescent Health in America, Staff and Kreager (2008) found that boys with high status in violent groups were at much greater risks of high school dropouts than other students (also Evans, Oates & Schwab, 1992; French & Conrad, 2001).

Much literature in developing country contexts often proved a positive relationship between amount of time that students worked to help their families and high dropout rates (Bickel & Pagaiannis, 1988; OUI, 2007; Rumberger, 1983). Some researchers even set a clear threshold of its detrimental effect, for example, over 14 hours a week by Mann (1989), or 20 hours a week by Winters (1986) (as cited in Mike et al., 2008). Working for some hours could help funding their schooling because costs of schooling were

often reported as a main obstacle for students to progress beyond a certain point of schooling (Cardoso & Verner, 2006).

3.1.1.2.3 Psychological factors

From a psychological perspective, high dropout rates were strongly correlated with low educational aspiration (St. John & Starkey, 1995), low self-esteem and low motivation (Finn, 1989; Natriello, 2002; Bridgeland, 2006; and OUI, 2007). Generally students with high learning motivation and education goals tended to have high level of self-regulation to achieve their set goals (Hidi and Harackiewicz, 2000). Student motivation level was mainly increased in school setting by their teachers' care, professional enthusiasm, interesting teaching methodology, and stimulating classroom environment (Cothran & Ennis, 2000). However, according to Hammer (2003), home environment also plays a crucial role in shaping motivation of a child. Positive parental encouragement and involvement in their children's education generally raised their children's intrinsic and extrinsic motivation.

3.1.2 Family Level

3.1.2.1 Family Structures

Family structures and mobility influenced the rates of dropout in several ways. It was a commonplace that a student who lives under the same roof with their biological parents had a high schooling survival rate than that whose parents passed away, got divorced or moved to work in other areas (Nicaise, Tonguthai & Fripont, 2000). Next, a large family size meant less learning opportunity for each of its household members and its influence became much stronger for older siblings (Nicaiso, Tonguthai & Fripont, 2000;

Rosati & Rossi, 2003). However, some studies (e.g. Chernichovsky, 985; Gome, 1984; Mike et al., 2008) found out that children in larger households were less likely to drop out.

3.1.2.2 Family Resources

It is widely believed that low socio-economic status of a family adversely influences dropout. A survey conducted by Open Society Institute in 2007 in six developing countries found that low economic status of a family was the prominent reason for education withdrawal. This finding was consistent with many other studies in different settings, such as in Brazil by Cardoso and Verner (2006), in China by Diyu (2002); in Thailand by Nicaise, *et al*. (2000) just to name a few. Regardless of contextual areas, the students whose parents are highly educated tend to stay in school long (Beherman et al., 2000; Mike et al., 2008; Swada & Lokshin, 2001). More specifically, Holmes (2003) showed that education attainment of a father increased the expected level of school retention of boys, while the education of a mother enhanced girls' schooling in Pakistan.

Having experienced a birth of an unwanted child and a sudden loss in remittance in the past six years that increase a high level of financial instability in a family also increases the likelihood of dropout (Lloyd, Mete & Grant, 2006). Cardoso and Verner (2006) suggested that when a father suddenly became unemployed, his children tended to drop out of school earlier in order to engage in income-generating jobs to help relieve family's financial burdens. Besides, a number of researchers ascertained that the economic crisis drastically changed the household patterns and then creates high dropout possibility (e.g., Thomas et al., 2004; Smith & Thomas, 2003; Behrman et al., 2000). It was clear evident that a sudden change in family resources would ignite high dropout.

3.1.2.3 Family Practices

The students whose parents monitor and regulate their schooling activities, provide emotional support, encourage independent decision making and are involved in their schooling are less likely to drop out of school (Astone & McLanalan, 1991; Rumber, 1995; Odaga & Heneveld, 1995; Rumberger et al., 1990). Usually, the motivation levels of the parents with higher educational attainment were found higher than those with lower attainment. The paucity of professional role model in their community hindered their imagination of education value, which resulted in devaluation of education for their children (Nicaise, Tonguthai & Fripont, 2000). The studies in America also revealed similar results (e.g. Natriello, 2002).

3.1.3 School Level

Organizational theories claimed that behaviors and nature of people in an organization and behavior and nature of an organization *per se* contributed to the high dropout rates (Chen, in press). Typically, good school quality, a term that covers most aspects of school factors, ranging from facilities to teaching staff and school management, produced low dropout and high completion rates (Hanushek, 2008; Hanushek & Lavy, 1994; Lloyd, Tawila, Clark & Mensch, 2003). The good quality school, in a long run, not only to provided children the high rates of return to education but also many other social returns, such as low infant and child mortality, better child health and education, lower fertility, less crime, and so on. In some studies, the students in small schools were found to be less likely to drop out than their counterparts in large schools (Werblow, 2009). The finding suggested that a quintile increase in school size was associated with a 12 percent

increase in average student dropout rate in American high schools.

At teacher level, a number of teacher characteristics lead to low retention of their students. First, teachers with low educational and pedagogical knowledge produced unproductive and less interesting teaching methods, which made students attend classes irregularly and had low academic achievement, as a result (Diyu, 2002). Parents become discouraged from further investing in their schooling. The most cited of all are teachers' motivation and absenteeism (Chaudhury et al., 2004; Nicaise, Tonguthai & Fripont, 2000). Low professional motivation and high absenteeism resulted from low financial incentives, poor working conditions, inadequate career opportunities, and poor supportive service. A few studies investigated teachers' origins and dropout rates, and they discovered that a school where most teachers resided in that community had low dropout rates (Lloyd et al., 2006). Finally, OUI (2007) reported that the teachers and schools who had negative, punitive and repressive attitudes towards slow learners and irregular-attending students pushed many students out of school.

3.1.4 Community and Government Level

At community level, a set of arguments usually won the attentions of researchers who studied relationship between community characteristics and dropout. Russel (2001) claimed that communities could influence dropout rates by providing employment opportunities during school (also Bickel & Pagainnis, 1988; Rumberger, 1983). Also, cultural influences were significantly attested as a variable explaining dropout decision. Low support from school community was one of main determinants in predicting high dropout rates (Natriello, 2002). Living in a more developed community was an

important and statistically significant factor in reducing the chance of drop-out of rural Pakistani children (Lloyd, Mete, and Grant, 2006).

Why many children are not in school can also be explained by the negative impacts of some supply-side predictors. When students needed to travel a long commute because of low availability of schools, dropping-out at a certain grade was inevitable (Lloyd, Mete & Sathar, 2005; Mike et al., 2008; OUI, 2007). Even a shortage of post-primary schools in a community was an important factor holding down enrollment in primary school and promoting early dropouts (Lavy, 1996). Another possible cause of school dropout was the deficiency in the link between education and the needs of local labor market (Nicaise, Tonguthai, and Fripont, 2000; and Natriello, 2002). If young people from agricultural areas had to go through a curriculum which was too academically oriented for them, they would become alienated from their surroundings. The fear of being alienated forced them to deny formal schooling.

3.2 Dropout in Cambodia

In Cambodia, different people viewed the causes of dropout differently. Teachers and their union constantly contended that school dropout was caused by the low salaries of teachers. As quoted on the Phnom Penh Post by Barton and Rith (2006), Rung, the president of the Cambodian Independent Teacher's Union, stated that low salaries led to high dropout rates because teachers needed to collect informal money from students, and they were not motivated to work. Corruption, poverty and bad school management have been culprits of dropout from parents' viewpoints.

There are a few studies conducted in Cambodia. Among them, a large-scale

study by the World Bank (2005) is the most prominent. Using data from a household survey and the annual school census, the study found that poverty, late school entry, inequality, low availability of schools, poor school management skills, teachers' low monetary incentives, low degree of community participation, inadequate school facilities, and low quality of the teachers were the main challenges leading the students to make early school departures. Poverty did not exert a direct influence on dropout, but it had an adverse effect on the children's ages of school entry and child labor, which negatively affected children's school retention. Besides, there are a few more studies on the dropout of Cambodian girls. In her focus-group-discussion study, Valesco (2001) stated that the predominant reasons why Cambodian girls did not attend or dropped out of school were the high level of housework and income-generating work. The work exhausted them and distracted their schooling with frequent absenteeism. The other factors were inaccessible distance of schools, security risks, late school entry, and early marriage. At the school level, three strong determinants were poor school facilities, low quality of teacher-student and student-student interaction, and poor quality of teaching and curriculum. Keng (2003) highlighted the causes of drop-out from two levels – individual and household. At an individual level, she found that late school entry, high absenteeism, repetition, low educational aspiration, and low aspiration for formal employment played pivotal roles in dropout. At the household level, Cambodian girls' schooling was negatively affected by the household tasks they performed, low education attainment of parents, discouraging attitude of parents, and education attainment of their siblings.

3.3 Types of Data Employed in the Prior Studies

In this section, three types of data that were commonly used in school dropout literature will be discussed. Their strong and weak points will be looked at and finally what kind of data is most suitable for investigating why students leave schooling will be suggested.

3.3.1 One-Wave Data

Many past studies on dropout were based on one-wave or retrospective data. This kind of data is usually pooled from a group of people to find out who stayed in or out of school, or whether research subjects received diploma or dropped the course at a specific time in the past. Researchers then calculate dropout rates based on the collected information.

Although it is useful for describing past trends, retrospective data have several limitations. First, they ignore the differences among groups of people, on which detailed analysis cannot be performed (Frase, 1989; Kominski, 1990). Second, they can exclude those who have died prior to data collection (GAO, 1986). They can, also, be biased if respondents inflate their educational attainment levels, claiming to have graduated when in fact they have not (Rumberger, 1987). Though some of these problems can be resolved through improved data collection, survival analysis principles suggest that retrospective summaries of student career data have two further weaknesses (Willett & Singer, 1991). They ignore the problem of censoring, assuming that people who have dropped out will never graduate and that people who have not graduated must be dropouts, and they ignore when people dropped out.

3.3.2 Two-Wave Data

Observing many shortcomings of retrospective data, *school drop-out* researchers turned to study students' academic careers prospectively. That made two-wave prospective data became popular. The most vital prospective two-wave approach is to compare total enrollments across time, either across or within grades. At the primary school level, for example, a grade-two dropout rate would be calculated by comparing one year's grade-two enrollment to the next year's grade-three enrollment. This formula has long been in use to calculate dropout rates. However, Morrow (1986) argued that such calculation did not account for the diverse paths that the students take through schools, such as transferring from one school to another, or stopping out temporarily but eventually returning. Year-to-year comparison of aggregate enrollment statistics cannot accurately characterize students' paths through school and therefore should not be used to study dropout and graduation patterns (Willett & Singer, 1991). The principles of survival analysis, which introduce the necessity of ascribing risk to specific periods of time, highlight a further flaw in the computation of annual attrition rates the masking of potentially important effects that can arise when data are combined across grades. Although these data are hypothetical, they clarify the need for researchers to move beyond calculation of simple annual attrition rates.

3.3.3 Panel Data

The need for multi-wave or panel data in a quest of understanding a dynamic process of dropout is clear. Estimating a list of grade-specific annual dropout rates improves on an aggregate two-wave approach but can be deceptive because each grade's annual dropout rate is based on a different cohort of students (Willett & Singer, 1991;

Singer & Willett, 2003). Instead of following several cohorts of students for a single year, a single cohort of students are observed for several years. Researchers adopting this strategy follow groups of students who share a common initial status until an expected date of graduation and sometimes longer. This kind of data permits researchers a clear observation of change on a specific predictor over time that influences dropout decision. It, thus, helps researchers understand this phenomenon more precisely than ever.

3.4 Trends of Event History Analysis

3.4.1 The Rise of Survival Analysis and Its Useful Application

To my knowledge received through a long series of searches using different types of search engines and academic databases services, most of the available literature on school dropout employed longitudinal analysis methods are originated from US. One importation reason that can explain this trend is that, in the United States, there are a handful of already-made panel data, such as data from the National Longitudinal Survey of Youth Adults, the National Survey of Families and Household, the Panel Study of Income Dynamics, the Beginning Postsecondary Students survey, and so on. Some school districts and universities also build strong coherent panel data banks for their own action research studies. The availability of these data banks allows researchers to build different kinds of longitudinal analysis models to investigate complexity of some educational issues more meaningfully. The longitudinal studies appeared even before 1970s when two powerful reviews of dropout literature by Spady (1970) and Tinto (1975) were made. Though they were long born, it was not until 1991 when Willet and Singer (1991) ascertained that only a few of them employed a true longitudinal method of analysis to investigate the process of

dropping out. They continued to propose a new way of studying the dynamic process of this educational problem, namely *Event History Analysis.*

Event history or survival analysis was originally developed in biostatistics modeling human lifetimes (Cox, 1972). Soon after its birth, it was widely extended to different fields, such as economics, sociology, engineering, business and education. It is, however, called differently according to the field it is applied. Until recently, this type of models can be seen under the names: failure-time models, life-time models, survival models, transition-rate models, response-time models, duration models, hazard models and event history models (Vermunt and Moors, n.d). In social science field, many researchers prefer to call it event history analysis method. This method is the most appropriate for a study of dynamic patterns of issues in educational setting, such as dropout or teacher attrition (Allison, 1984; Singer& Willett, 1993, 2003; Willett & Singer, 1991).

There are two important merits that this method has, in comparison to normal logistic regression and other kinds of statistical tools available. First, it can deal with problems of data censoring. Normal regression models can only answer to the question 'whether or not a student drops out of school' but they cannot tell us when the dropout occurs. By dividing when the whole process of dropout into two categories, researchers fail to understand a meaningful process that can lead to a more effective intervention of the problem (Willett & Singer, 1991). Second, it allows researchers to build time-varying covariates into their analyses. Like achievement issues where the present performance of a student is not entirely dependent on their present conditions, student dropout is also an accumulative process that starts from the very early grades. Simply explained, event history

predicts hazard probabilities of each student across the grades before they finally drop out at a certain grade. It also observes changes in some independent predictors throughout years that will lead to the event of dropout. Hence, a comprehensive understanding of this educational wastage phenomenon can be acquired by employing this kind of method.

3.4.2 The Studies Using Survival Method

There were a few dropout research studies employing survival method before the methodology alert by Willett and Singer in 1991 (e.g. Mensch & Kandel, 1988). After a notification of how accurate and meaningful this method was, a large body of literature on early school leaving using this method was accumulating. Below are descriptions of some featured studies in the field (see Table 3.1 for a detail of each study).

The following studies were conducted to investigate the relationship between high school completion and several predictors on student and family characteristics (see Table 3.1). Forste and Tienda (1992), for example, pooled data from the National Survey and Household which had been on conducted on 1,778 women aged 20-29 in 1978-1988. Those women were mainly from three different ethnical groups, namely Blacks, Whites and Hispanics. They divided the whole analysis into four different models. The first model was built for the whole sample, regardless of the race. The last three models were race-specific models built for each of the three above-mentioned ethic groups. They also included two time-varying covariates on the childrearing predictor in their models. The results from the analyses showed that high level of a mother’s education and the presence of both parents in home increased the likelihood of high completion of the female Americans overall. Early parenthood and staying large family and the families received public aid, however, tended

to put those women at risk of dropping-out. The influence levels differed among races. Thought they used event history method to story the process of dropping-out, they admitted that the results from their study were tentative, for the data used did not indicate when the hazard sample discontinued their education careers. Two years later, Astone and Upchurch (1994) investigated similar relationship between family formation and school dropout among different ethnic groups in US. Their study was larger in terms of sample size and they included three different cohorts in the analysis models.

Some more studies existed in a quest for relationship between students' prior academic achievement and their school pathways (e.g. Bowers, 2010; Randolph, Fraser & Orthner, 2004; Roderick, 1994). Randolph, Fraser and Orthner looked at only the relationship between the first-grade repetition experience and later school dropout, after controlling for three background variables, namely student gender, race and extra-curricular activity participation. No time-dependent variables were included in the analysis models. Though it was conducted 10 years earlier, Roderick's study was more detailed and complete than the formerly-mentioned study. He explored how repetition experiences from kindergarten to grade 6 were associated with the dropout of American youth aged 16-19. He built four different variables on repetition experiences and later on he formed interaction variables of students' ages and repletion experiences. The prior academic grade and student attendance were carefully controlled. The most recent study by Bowers (2010) was more informative in terms of policy implication. He built explanatory variables for the dropout at each grade, which led him reach a sound conclusion that the American youths started to be at risk of dropout since grade 7, not grade 9 as predicted by school districts. These three

studies arrived at the same conclusion that early grade retention increased higher probability of school dropout at later grades.

There were studies that sought for significant predictors at the family level. Though using different data sources, Orthner and Randolph (1999) and Hao and Cherlin (2004) examined how the American social welfare reforms mediated a few individual and family variables, namely parent work status and incomes, which subsequently improved graduation rates of their household members. Hao and Cherlin constructed much more complete models to acquire a full understanding of the phenomenon. They employed a quasi-experimental method to observe influential difference of a cohort that had never experienced the welfare reform (*Prereform cohort*) and the one that benefited from reform (*Reform cohort*). Chen and DesJardins (2008), later on, specifically looked at the impact of family financial aid on graduation and dropout rates of the students from the poor and rich families. They built a handful of time-varying covariates and interaction variables to scrutinize their relationship in detail.

Until recently, Reisel and Brekke (2010) were able to conduct a comparative study on dropout of university students in US and Norway. They used two different datasets. In US, they selected NELS 1988, a survey conducted on youth aged 18-24, and they could finally include 3,690 American youths in their study. On Norway side, there was a panel data prepared for educational careers of Norwegian youths, and they could use valid information of 37,056 youths. Due to the difference in the two datasets, they could include only six variables into their analytical models.

In developing countries, very few studies employed this method. One of the

main reasons is the lack of available panel data. Using retrospective data, Akhtar (1996) and Grant & Hallman (2008) were able to observe the patterns of dropout with some family predictors by gender and pregnancy-related dropout and prior school performance respectively. Grant and Hallman used the 2001 survey "Transitions to Adulthood in the Context of AIDS in South Africa," conducted in one province. Due to a shortage of information on the time that the sample students left school and on some other important variables, they carried out interviews with some of the sample on voluntary base. Akhtar built his analytical models on only available one-wave data from a household survey conducted in 1987-88.

All mentioned studies used secondary retrospective data, though some of them used panel data, pooled by certain organizations. The studies that solely relied on the retrospective data faced many limitations. First they neglected the time when students leave their education careers and they might over- or under-estimate the numbers of dropouts. Simply explained, the pooled data ignored the issue of censoring. They considered the students who were not in school at the time of survey as dropouts, though some of them might return to schooling (Willet & Singer, 1991). Because the main purposes of already-made data were not intended to explore the issues of dropout, the information available in those datasets would limit the number of its potential predictors (Chen & DesJardins, 2008). When few variables were put into analysis, without controlling for influences from other significant factors, researchers could not confidently ascertain the significant predictors that they found would never change if more variable were included. Since 2000, most of the event history dropout studies have only conducted in higher education contexts. For several studies conducted in

developing countries, though the researchers claimed that they employed event history techniques, they did not capture the full features of event history method. Those studies were not able to include time-varying predictors in their models; plus the data itself was retrospective. Though a series of interviews were conducted on the respondents, after five or six years of the prior survey, to dig out a full desired history of each sample child, how much reliable obtained data is remains a big challenge for them. From the review, few researchers have modeled the relationship between when students drop out (or graduate) and student, family, and school characteristics.

A more comprehensive study that includes most of the potential variables should be further conducted to extend knowledge of school dropout phenomenon, especially in the contexts of developing countries.

Table 3.1. **Summaries of the prior studies using event history method (survival method)**

Auther(s) & Year	Data Source(s) & Year	Sample	Outcome Variable	Predictors	Main Focus
Mensch & Kandel (1988)	The National Longitudinal Survey of Youth Adults in 1984	The youth aged 19-27 across the US (N=11,684) [HIGH SCHOOL]	Dropping out vs. receiving a GED	**Student:** Demographics, Sexuality, Drug use, Delinquency, Low self-esteem, Locus of control, AFQT score, Pregnancy **Family:** Parental education, Family structure, **Community:** Residency area	Relationship between high school dropout and drug abuse
Forste & Tienda (1992)	National Survey of Families and Household (1987-88)	The women aged 20-29 from different ethnic groups (N=1,778) [HIGH SCHOOL]	High school completion	**Student:** Ethnicity and parenthood **Family:** Mother's education, Mother's employment status, Family structure, Public aid received, Family size	The influence of family formation on graduation likelihood of American youths from different ethnic groups
Astone & Upchurch (1994)	The Panel Study of Income Dynamics (1920-29, 1930-44, 1945-60)	The White and African women aged 25-65 in 1985 **Number of sample:** 1920-29 (N = 507) 1930-44 (N = 873) 1945-60 (N = 1675) [HIGH SCHOOL]	High school completion or dropping out	**Student:** Family formation, Demographics **Family:** Family size, Mother's education, Family structure, Family migration **Community:** Residency Area	The influence of family formation on graduation likelihood of American youths from different ethnic groups
Roderick (1994)	School transcript information, Fall River, Massachusetts (1980-81)	Seventh-graders in 1980-81 (N=707) [JUNIOR HIGH SCHOOL]	Leaving school at the age of 16-19	**Student:** Academic background, Repetition, Achievement, Attendance **Family:** Family size, Father's occupation **School:** School quality	Prior repetition experience at K-6 levels and high school dropout
Akhtar (1996)	Household Survey in Karachi , Pakistan (1987-88)	All children of school-going age at the time of survey (N=27,427) [K-12 LEVEL]	Dropout (received diploma or dropped out)	**Student:** Gender, Age, Year of schooling **Family:** Parental education, Employment status, Income, Family size, Residency period, Per capita GNP, Age of family head	Sought for differences of dropout patterns between urban Pakistani boys and girls

Table 3.1. (continued)

Auther(s) & Year	Data Source(s) & Year	Sample	Outcome Variable	Predictors	Main Focus
DesJardins, Ahlburge, & McCall (1999)	Students' 7-year records at the University of Minnesota (Starting from 1986)	The newly-enrolled students in the fall term of 1986 (N=3,975) [HIGER EDUCATION]	Stopout, dropout, and graduation	**Student:** Demographics, Gender, Disability, ACT score, High school rank, Enrollment age, GPA, Athletic status, Transfer credit, Earning, Scholarship, Grant, Work status **Family:** Residency area **Institution:** Departments, School loan	The relationship between college departure and student attributes
Orthner & Randolph (1999)	The data collected for a longitudinal monitoring of parents and children influenced by welfare reform in the 1990s	The youths from low-income households (N=4,437) [HIGH SCHOOL]	Dropout or graduation	**Student:** Gender, Demographics **Family:** Parental work status, Family welfare reception	The impact of parental work and social welfare reception on high school dropout rates by different grade cohorts
Hao & Cherlin (2004)	The National Longitudinal Survey of Youth (1997-2000)	Two cohorts of girls aged 14-17 by the time of survey (N=4,385) [JUNIOR HIGH SCHOOL]	Teenage pregnancy, childbirth and school dropout	**Student:** Age, ethnicity, F**amily:** Family structure, Parental income, Parental education, Parental welfare receipt	Explored the impact of welfare reform on the three main dependent variables
Crowder & Teachman (2004)	Panel Study of Income Dynamics	The adolescents aged 13-19 born in 1979 Dropout (N=1,643) Premarital (N=1,361) [HIGH SCHOOL]	Dropout and premarital childbearing	**Student:** Gender, Ethnicity, Age **Family:** Family income, Parental education, Family size **Community:** Living arrangement, Residency, The changes in the two variables	Investigated how the changes in residential conditions and living arrangements influenced dropout risks and premarital childbearing
Randolph, Fraser, & Orther (2004)	Data from an urban school district	The youths enrolled in high school in 1989-90 (N=692) [HIGH SCHOOL]	Hazard rate of dropout	**Student:** Gender, Race, First grade repetition, Extra-curricular activity participation	Repetition in grade one and high school dropout probability
Randolph (2006)	Data from an urban school district	Nine-graders from low-income households in one urban school district (N=686) [HIGH SCHOOL]	Hazard rate of dropout	**Student:** Demographics, Academic achievement, Behaviors **Family:** Family income, Maternal employment	Investigated how the two family risks (income level and mother's employment status) influenced dropout decision

Table 3.1. (continued)

Auther(s) & Year	Data Source(s) & Year	Sample	Outcome Variable	Predictors	Main Focus
Chen & DesJardins (2008)	The Beginning Postsecondary Students survey (1996-2001)	The students who started their postsecondary education in 1995-96 (N=6,733) [HIGHER EDUCATION]	Dropout (obtained a degree or dropped out)	**Student:** Age, Gender, Race, GPA, SAT score, Aid status, Work-study status **Family:** Income, Parental education, Parents' education aspiration,	Investigated whether or not student aid mediated the relationship between parental income and dropout behaviors
Lott, Gardner, & Powers (2009)	The university data on each student enrolling in 1984-99	The doctoral students in 56 departments of an American university. (N=3,614) [POSTGRADUATE]	Dropout or graduation	**Student:** Demographics, Gender, Age, Marital status, Citizenship, Major, GRE	Sought for a sound explanation of why doctoral students chose to remain or drop their programs
Reisel & Brekke (2010)	US dataset: NELS 1988 (1988-00) Norway dataset: Data for Educational Careers (1990-98)	The 18-24 year-olds enrolling in US (N=3,690) and Norway (N=37,056) higher education institutions [HIGHER EDUCATION]	Staying enrolled, dropout or graduation	**Student:** Demographics, Gender, Age of entry, Selected field of study **Family:** Income, Parental education	Compared the patterns of dropout among minority and majority university students in Norway and US
Bowers (2010)	Student data from 2 school districts	The entire cohort of the class of 2006 from two districts (N=193) [HIGH SCHOOL]	Graduation, transfer, or dropout	**Student:** Demographics, Gender, Grade history, Retention	Investigated a relationship between the prior grades students received and dropout event
Chen (in press)	Combination of 2 datasets: Beginning Postsecondary Student (1996-01) and Integrated Postsecondary Education Data System (1995-00)	The university students attending 400 four-year institutions [HIGHER EDUCATION]	Dropout or not during 4 years	**Student:** Demographics, SES Background, Student aspiration, Achievement, Financial aid, Integration on campus **Institution:** Structure, Faculty, Finance, Student demographics	Explored how institutional characters put students at risk of dropping their college

3.5 Theoretical Framework of the Study

This research employed event history or survival method, using multi-wave data that included many important dropout determinants. After consulting extensive existing literature, a number of variables that were considered to be relevant to the Cambodian context were included into the research framework (see Figure 3.1). Modeled on an analytical framework of survival studies developed by Jonhston (1984), the whole bunch of included variables was classified into time-invariant and time-varying covariates. On the time-invariant domain, some variables on student and family background, for example gender, age at first school entry, and parent education attainment, and so on, were introduced. The independent explanatory variables never change over time. These variables were hypothesized to have some influences on time-varying variables, or they would generate directly adverse effect on student dropout. Some variables, such as grade retention, self-esteem, family divorce, etc. were labeled as time-varying predictors. These variables continually change their values over the observation period. For a practical instance, some students reported that they never experienced grade retention in the first year of data collection, but in second year, they repeated a grade. There was, thus, a change in their retention experience from year 1 to year 2. That is what time-varying covariates in this analytical frame were built for such a change and to see if that change would increase the chance of dropout or not. At the bottom part of Figure 3.1 is the outcome variable that consists dropout status (whether or not a student left school) and event time (if yes, at which observation time the event of dropout occured). Those sample students who continued their educational careers by the end of data collection period were recorded as

right censored observations. Detailed description of the whole model will be discussed in the method part of each study in Chapter 4.

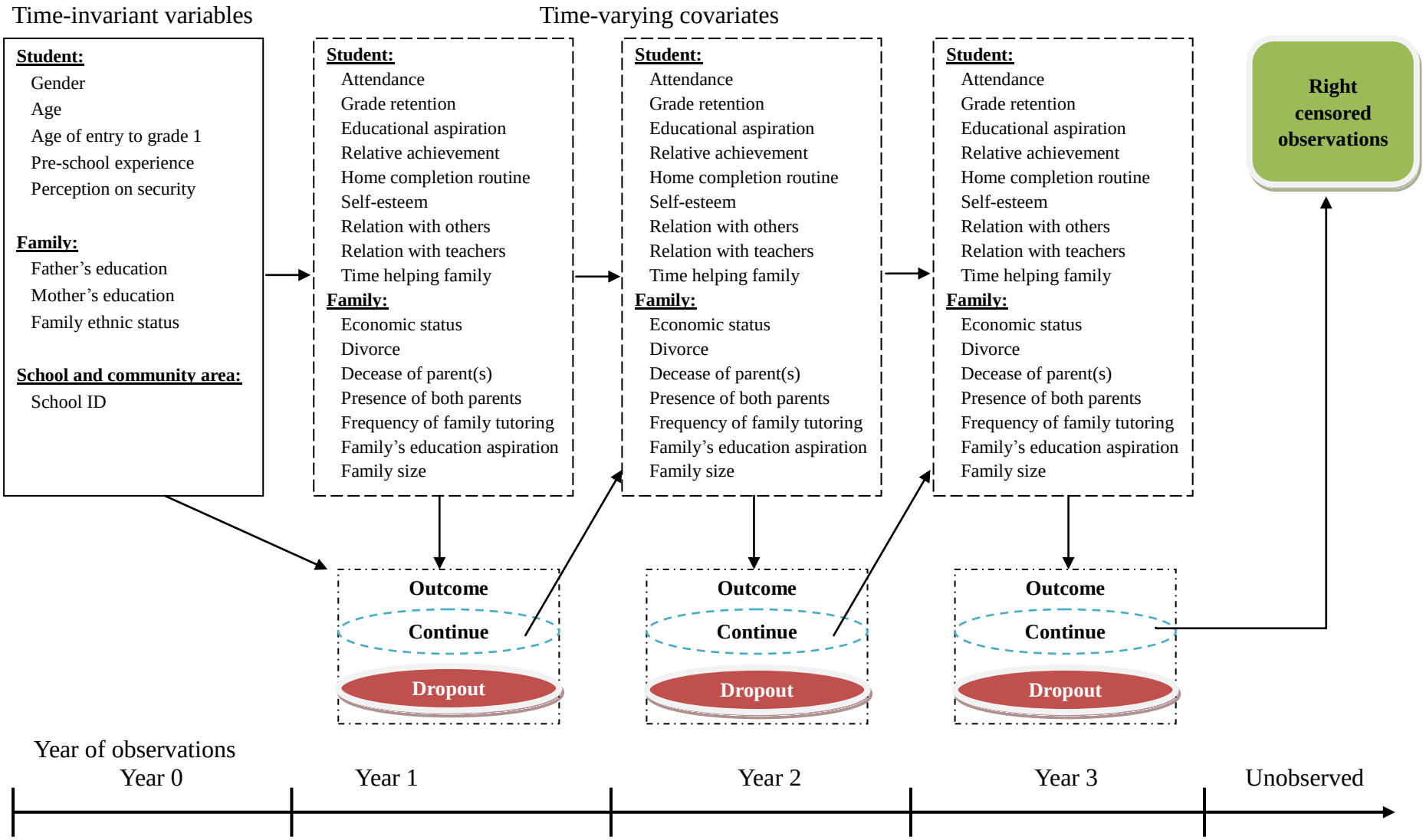


Figure 3.1. Model specification for the analytical framework of the study. Adapted from Johnston (1984)

CHAPTER 4

RESEARCH METHODOLOGY

4.1 Overall Methodology

As previously stated in section 1.3, this study is a longitudinal causal-comparative research in kind, using event history analysis method to study the behaviors of changes in dropout when students' grades continued to vary. With this method, the researcher worked with in-school children to collect their individual information and that of their families at the beginning of academic year. One year later, the researcher went back to check whether or not some particular groups had dropped out and then data from the surviving panel students was collected. This method of data collection was applied for whole three years. Other data on school and community factors were also pooled from the very local to the national level; the methods and procedures of data collection will be explained in detail in the following sections.

4.1.1 Research Area

Kampong Cham was purposively chosen. The selection procedures will be explained in the sample and sampling part (Section 4.2.3.2). This section briefly describes conditions of this province in order to facilitate readers' understanding of the result and discussion parts.

4.1.1.1 Provincial Administration and Settings

Kampong Cham is located 124 kilometers or so away from the capital city Phnom Penh. It is subdivided into 17 districts. All the districts consist of 173 communes or

1,758 villages. Unlike other provinces in Cambodia, Kampong Cham has two towns, namely Kampong Cham named after the province name *per se* and Suong, a newly-formed town.

Kampong Cham is the largest province in Cambodia in terms of population. According to the 2008 national census conducted by National Institute of Statistics [NIS] (2009, August), its population is 1,679,992, which accounts for 12.54% of the national population, though this share has decreased, compared with 14.07% in 1998. The whole provincial population resides in 369,458 households with an average of 4.5 persons per household. There are three main ethnic minority groups inhabiting in this province, namely Khmer Islamic, Stieng and Vietnamese consisting of 23,598; 415; and 226 families respectively (National Committee for Sub-National Democratic Development [NCDD], 2009).

Since this province is located along Mekong River, it is very favorable for agricultural work. Eighty two percent of its population worked in agricultural sector, while eight percent is involved in business and other service-providing work. Remaining 9% possess uncertain kinds of occupations (NCDD, 2009). This province is also famous for the large rubber plantations, cashew crops, cassava plantations, and rice paddies. Due to its geographical advantages together with other social and legal-process facilities, this province was selected as the number-one pro-business environment province in Cambodia (NIS, 2009 August). Besides agricultural occupations, around 4% of all families have at least one member working in public sector and 10% of them with at least a member working in private sectors (NCDD, 2009). These proportions are a bit higher than most of provinces in Cambodia.

All areas in the province are accessible. Bitumen and macadam roads account for 11.8% of all roads, which are 3,302,945 meters long. Laterite roads consume 45.7%, while another 42.4% are earth roads. Generally, Bitumen roads are national roads that connect to other provinces or the ones that lead to commercial zones and large plantations. Laterite roads normally connect nearby villages to the main roads; however, inside-village roads are earth roads.

Up to 2008, there were 80 electricity generating stations in the whole province. Those stations are normally located in towns or active business regions, whereas in rural parts, most of the houses are lighted with batteries. Statistically, only 17 % of houses have access to electricity, while 66 % of them use batteries as sources of lighting and the remaining percentages use other sources of lighting due to the levels of family wealth. With regards water sources, 57 % of the families have water sources at home or less than 150 meters away, while the remaining percentages need to travel more 150 meters to fetch water (NCDD, 2009). People in towns usually have access to tap water, whereas those living along Mekong River have full year-round access to this river as their source of water supply. Ring wells are more common in this province than pump wells, to those who reside far away from the river.

4.1.1.2 General Education in Kampong Cham

This section will highlight the progression of the general education situation in Kampong Cham Province from 1996 to present, in comparison with the situation of the whole country. It should be informed that general education means the education provided from the kindergarten to upper-secondary school level (K-12).

4.1.1.2.1 Pre-school Service

Pre-school education in Cambodia refers to the education provided to the children aged from three to five years old in the formal or non-formal settings free of charge. The whole service is divided into three levels, simply explained the first level for three-year-olds; the second level for four-year-olds; and the third level for five-year-olds. This education of such is provided in state preschools, community preschools and home-based programs. The state preschools are usually located within primary schools and run directly by the state, while community schools are operated by community members, who usually receive several days of training before starting their careers. In home-based programs, mothers play crucial roles in educating their own children. Generally, they are trained on a weekly base by core mothers who are specialized in pre-school education (Rao & Pearson, 2009). However this section emphasizes on progression of the state preschools only, since little empirical evidence of community and home-based programs is available.

Similar to the country-level trend, the improvement in preschool education service of this province is very marginal. Though the numbers of schools, teaching staff and enrolled children have tripled during the last decade, it could serve around 10% of the newly-born children of this province. As shown in Figure 4.2.1, the number of schools and enrolled children soared up from 74 and 4,527 to 216 and 11,972 respectively. Generally, preschool education service is provided in the state elementary schools located in or near town centers where there are surplus of teaching staff members. Surprisingly, it can be observed that the repetition and dropout rates at this level were almost 0%, according to the statistics provided by EMIS of MoEYS from 1996-97 to 2010-11.

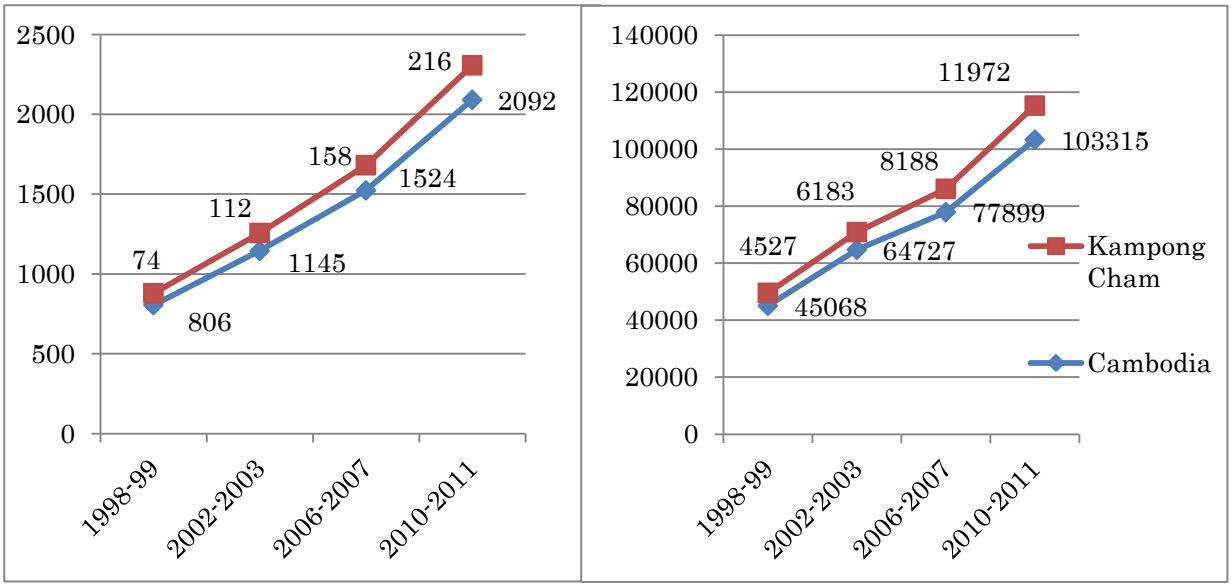


Figure 4.2.1. Improvement in numbers of state preschools (left) and enrolled children (right) from 1998-99 to 2010-11

Source: MoEYS Education Management Information System (1999, 2003, 2007 & 2011)

4.1.1.2.2 Primary School Level

A marked physical expansion of schooling can be observed throughout this province after a collapse of the Khmer Rouge administration in 1979. More schools were constructed to accommodate school-age children; more teaching and administrative staff was designated to less served areas to ensure an equitable access of schooling for all. Table 4.1 illustrates the increasing numbers of primary schools of this province. In the academic year 1998-99, there were 710 primary schools but, in 2010-11, the number soared up to 792. Though the increased number is not so huge, the quality of school buildings *per se* can indicate a physical improvement of school conditions. For instance, in 1999, out of the total number of 1,764 schools (both primary and secondary schools), only 994 schools were in concrete structure, while the rest were built from wood or bamboo. However, in 2011, this

province had 2,265 schools in total and 2,005 of them were concrete buildings with proper flooring and roof (EMIS, 1999 & 2011). Meanwhile, NER and GER sharply increased from 70.5 and 78.9 in 1998-99 to 96.8 and 116.2 in 2010-11 respectively. It is worth noting that the sharp increases of enrollment rates were a product of tuition fee abolishment adopted by RGC in 2000.

However, by scrutinizing Table 4.2.1, one might pose a question on a steep decrease of primary school classes from 7818 in 2006-07 to 5266 in 2010-11. Two main possible explanations could respond to the query. First, the number of primary-school-age children started to dwindle. The numerical values in Table 4.2.1 and Figure 4.2.2 are clear evidence. Though there was enhancement of NER from 91.1% to 96.8%, the number of enrolled children declined from 330,044 to 292,247 in 1998-99 and 2010-11 relatively. The second cause of this reduction was the decrease of repetition rate. Third explanation was owed to the so-called *'one commune one lower-secondary school'* policy from RGC, as stated in its Education Sector Support Program 2006-2010 by MoEYS (December, 2005). Lower-secondary school buildings were built inside main primary schools of the communes. Because RGC could not afford the physical expansion of school facilities, several classes from each main primary school have been allocated for lower-secondary school classes.

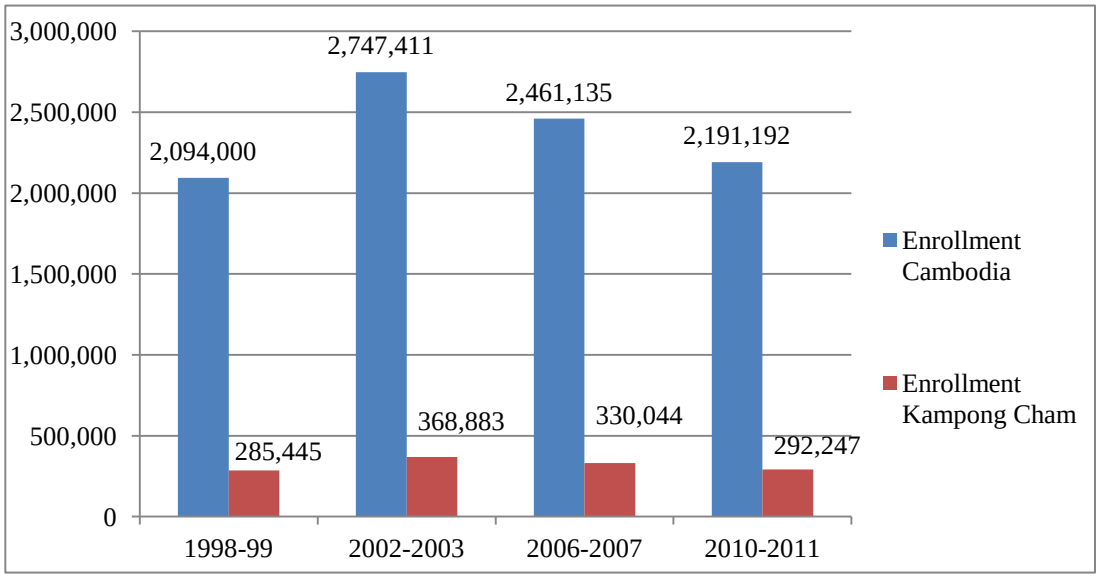


Figure 4.2.2. The numbers of the enrolled children in Kampong Cham Province and the whole kingdom from 1998-99 to 2010-11

From Table 4.1, two more important points are worth mentioning. First, there were sharp declining rates of repetition in this province. In 1998-99, around 25.5 % of primary school students were reported to have repeated grades at primary school cycle, but the rates rapidly went down to only 5.9% in 2010-11. The highest rates were in grades one and two, around 9.9% and 6.7% respectively. If the quality of education can be measured by promotion rates as what MoEYS indicated, it can be said that this province is moving on a right direction. Save the Children (2006) conducted standard tests (mathematics and Khmer) on grade-three students from six provinces, one of which was Kampong Cham. It was reported that the student achievement in those provinces was relatively low, unsatisfactory. Another point that deserves some space here is rates of dropout. Even though some improvement can be observed, still this province had a higher dropout rate compared to an overall rate of the country, 8.7% (MoEYS, 2011). Much work needs to be done to catch up with a nation-level progress.

Table 4.1. **Overall educational improvement in Kampong Cham**

Level	Academic Year	School	Classes	Teaching Staff	NER	GER	Repetition	Dropout
Primary School	1998-99	710	6952	5936	70.5	78.9	25.5	N/A
	2002-03	747	7882	6105	88.2	116.5	14.5	N/A
	2006-07	767	7818	5586	91.1	119.6	13.6	12.2
	2010-11	792	5266	5021	96.8	116.2	5.9	10.1
Lower Secondary School	1998-99	35			12.8	19.2	10.5	N/A
	2002-03	36			16.5	29.8	4.5	N/A
	2006-07	78	651	933	25	45.4	2.2	26.9
	2010-11	126	740	1208	28.3	47.6	1.8	22.4
Upper Secondary School	1998-99	19			3.9	4.4	4.2	N/A
	2002-03	23			4.8	8	10.5	N/A
	2006-07	35	1166	1822	8.8	14.3	2.6	18.8
	2010-11	55	1440	2309	14.4	21.9	1.2	13
Secondary School (Lower &Upper)	1998-99		950	2122				
	2002-03		1354	2652				

4.1.1.2.3 Secondary School Level

Like the trends of improvement at preschool and primary school levels, at secondary school level, physical expansion and education access progress is very impressive, though it is incomparable to that of primary school cycle. After the government initiative of *'one village one primary school', 'one commune one lower-secondary school'* and *'one district one upper-secondary school'* policies, the number of schools, both lower and upper secondary schools almost doubled in the last four years. With a surge in school buildings, there saw little improvement over the NER, though. At upper-secondary level, the growth of

present NER of 14.4% from 8.8% in 2006-07 and GER of 21.9% from 14.3% was quite sustainable. At lower-secondary level, however, not more than four percentage point differences could be achieved on NER and GER since the policy initiative year. It did not respond to a large physical investment provided.

On the quality side, Kampong Cham ranked low in terms of promotion rates and high at dropout. As stated earlier, this province is very close to the capital city, Phnom Penh. It is, thus, expected to grow faster than most rural provinces. Though it had lower repetition rates than the national rate, it was very likely that due to high dropout rates, some academically poor-performance students left schools, which made this province at advantage over other provinces at national exam[5].

4.1.2 Sample and Sampling Method

Kampong Cham was purposively selected as the study area. Three main important reasons inspired the researcher to have chosen this site. First, for a purpose of ecological generalizability, this province represents a common socio-economic condition of most rural provinces in Cambodia. If a reliable sample could be withdrawn from it, results can be, to a large extent, generalized to most of rural provinces. Second, dropout rates of all grades at basic education level were not quite different from those of the whole country. For instance, in 2007, the year when the study started, a primary school dropout rate in Kampong was 12.2%, in comparison to a country rate of 11.6% (EMIS, 2007). Though it was a little bit higher, it was well-fitted to the study. Unlike most Cambodian provinces at that time, this

[5] It should be noted that there are national graduation exams for lower and upper secondary school exits.

province consisted of only two geographic divisions, namely rural and urban. Hence, the researcher was quite confident that, except for Kampong Cham district[6], any site in Kampong Cham was considered as rural. EMIS dataset did not specify which schools or which parts of a province were considered as remote or rural. It just indicated an urban part, a district at which a town center is located.

Since this study requires panel longitudinal data, the researcher could not deal with a large number of samples. Only five primary and five lower-secondary schools were included. To obtain sample schools, all the schools in province were sorted in accordance to their rates of dropout in 2006-07. The process of selecting primary schools and lower secondary schools is the same. A selection process for primary schools will be, hence, illustrated in detail.

After sorting, stratified random sampling was employed. All schools were segmented into five groups based on their dropout rates. There was a 10-percentage point variation within each group. For example, the first group comprised of those schools which had dropout rates from 0% to 10%, whereas the last group had dropout rates more than 40%. From each group, a school was randomly selected. The intention of such selection process was to seek for some school differences that might boost up or lessen their school rates. As a result, ten schools – five primary and five lower secondary schools – were picked. The selected schools are scattered in nine different districts out of 16 districts of the province. To go to some needed a few hours of motor riding, from the town center.

[6] Suong was urbanized as town in 2009. Fortunately, none of sample schools is located in this new town.

From each primary school, grades one and four were selected; as for lower-secondary school, grade seven was included. As a hypothesis had been made that dropout causes varied throughout grades, this selection would help the researcher respond to the set hypothesis. With such division, analysis by cohorts can also be conducted to further understand evolving process of this education issue. Meanwhile, the researcher wished to cover all grades at basic education level in three years' time.

A number of education stakeholders became participants of the study. Due to small sample size of schools, the information from interviews with principals and teachers will only be utilized to explain a phenomenon, rather than underline root causes of dropout.

4.1.2.1.1 Characteristics of Sample Schools

4.1.2.1.1.1 Primary Schools

Based on stratified random sampling, five primary schools were selected as sample schools. These five schools are located in five different districts.

Primary School 1 is around 122 kilometers away from the main town (Kampong Cham), but it is just 59 kilometers from the capital city. It was established in 1997 with donation from community and outside financial assistance from religious ceremonies. This school attracts children from two villages. Due to a surging deduction in birth rates of its catchment area, it has enjoyed small size of students in each grade and operated in one shift. As shown in Table 4.2, the class size of 24 students was reported as the largest in this school. That was why when the researcher visited this school for the first time in 2007, it became an incomplete school. All six-graders were transferred to a school nearby, around 2 kilometers away. Since 2008, there were only four grades available. Though the community and school

worked hard to request for new teachers to fulfill the vacant positions of the formerly retired teaching staff, their requesting voice was never heard. Instead, more and more students poured out of this school to attend the nearby school, where it had surplus of teachers and received financial supports from an international organization to run an almost full day class for its students. It should be noted that people in this school catchment area were motivated to send their children to school earlier and the school itself keeps a good record on which house had school-age children.

Primary School 2 is about 32 kilometers from the town center and it is 6 kilometers off a tarmac road. It was built in 1980. Since its establishment, it changed two principals. The current principal is the third. He was recently appointed to the position. It was run in two shifts, with an average student-teacher ratio of 46.2 or so. In total, it had 10 teaching and 4 non-teaching staffs; opportunely it had no contract teachers. Since this school is located on the bank of Mekong River, during the rising season, the river swells and it floods the whole school area. The school thus closes during this season. Most of its facilities and important documents were also damaged in each flooding period. There was no library facility available, for the school itself was in shortage of classes. Through interviews with principal and teachers, it was reported that community hardly ever participated in school activities and fund-raise programs. During four times of observation, the researcher found there was a little variation in the number of enrolled children. This school was located very close to a lower secondary school and its catchment area covered four villages of a commune. In comparison with other schools, the commute distance for students was quite long.

School 3 is situated on the main road, though it is distant from the town center.

Like most of the schools located on main roads, it enjoyed much assistance from the government, political parties and international organizations. All the buildings are concrete. In 2008, a lower secondary school was established in this school compound. A new upper-secondary school was also planned to construct so that students in that area did not have to travel long distance. It was awarded as the second best primary school of the district in terms of raising quality of education by reducing a large percentage of repetition rates during the last few years. In 2009, it was reported that an average promotion rate was more than 90% and it kept increasing every year. Its library was opened for students for the whole two shifts with an average of 1,281 entrants a month, according to a record in 2009-2010. Unlike the conditions in other sample schools, some private English classes were available for the students on an hourly payment base; that was, a student had to pay around USD 10 cents per one-hour class. Despite some good conditions, it also met many challenges. First, there were only nine teaching staffs (see Table 4.2). Because of a dire need of teachers, a retired teacher was requested to remain in a position, according to an interview with the principal. The pupil-teacher ratio was around 60.2 though the class size was not so large, 43 students per class. One teacher was assigned to take over a preschool class of 46 students. There were 5 non-teaching personnel (2 principals, 1 secretary, 1 librarian, and 1 life-skill teacher).

School 4 is around 39 kilometers from the main town, and it is accessible with difficulty by a bumpy and dusty road. It is located in a commune where almost all its citizens are Muslim Cambodian or Cham people. After completing this school, if a student needed to pursue their educational careers to lower secondary school, they needed to cross the river to

the other side of Mekong River, where there is a secondary school. The price of ferry commutation is free of charge for the students, luckily. Because of the under-development of this area, little attention was paid to this school. There were only two official teachers including the principal, himself. In 2007, there were four official teachers and three contract teachers; however, two newly recruited teachers asked for transferring. As a result, only two official teachers remained and three contract teachers were appointed in 2010. The pupil-teacher ratio was 96.2 in 2010. Due to a severe shortage of teachers, this school was run in three shifts in 2008. It was a rare case among most rural schools. With regard students, they could not speak Khmer (the official language in Cambodia) at all when they started their first grade. All the official teachers reported their classroom chaos, where they could not take a full control over their classes. Fortunately, with agreement from the district office of education, this school could manage to hire an assistant teacher, who could speak Cham and Khmer languages fluently. Her responsibility was to interpret what core teachers spoke, assisted them preparing lessons and substituting them once they were absent. Though this school had the highest dropout rates among all the sample schools, the managerial skills and abilities of the principal were quite satisfactory. Only in this school, the children club was working, the five and six-graders helped teach the identified slow learners in grades one and two for 15 minutes on the second break. He could manage the file documents and maintained high quality relationship with the district office as well as the community. He earned much trust from his community. This school enjoyed little school facility. Its compound was so small; and there was no sport facility available. In 2009, Room to Read provided books and other library facilities to this school; it was the first time that it had a

library for students to read and do self-learning.

School 5 is located on far away from the provincial town and the capital city. Like a condition in Primary School 4, it lacked a lot of well-trained teaching staffs. Before 2008, it was an incomplete school, which was annexed to a main primary school located around 6 kilometers away. On the first research observation in 2007, this school had no permanent building. It had two multiple-grade classes. A class of grades one and two was carried out in a small public house while the class of grades three and four was conducted at the house of a contract teacher. There were around 132 students in the first multiple-grade class, but in the class of grades 3 and 4, there around 28 students at the time of the first research visit. In that year, the first-ever official teacher was sent to this school, though this school was run with a voluntary help from some community teachers since 1998. Because of teacher and classroom shortage, grade 4 was the highest grade taught until 2007. Some motivated four-graders reported that they attended this grade for two or years, in waiting for the grade-five class that had been promised to run in the next academic year. In 2009, one international organization funded a school construction. A building of six rooms was constructed and opened for students to use. Together, a playground, pumping well and toilet were built. With enough rooms, it extended its service up to grade 5. It remained in a dire need of more teaching staff, though. Until recently, there was still an officially appointed teacher in this school, and he became a school principal in 2009. In 2010, it covered all grades of primary school. To be able to fully operate, three contract teachers were hired from the community and the principal also instructed the sixth grade. In average, an average pupil-teacher ratio was 85.5. With contract teachers, students reports heavy absenteeism of

their teachers in comparison to the conditions in other schools.

Table 4.2. **A brief overview of the primary school sample in 2009-2010**

Schools & Grades		Enrolled Children	Promotion Rate	Repetition Rate	Dropout Rate	Staff			Rooms
						Teaching	Contract	Non-teach	
Primary School 1	Grade 1	24	83.3	16.7	0.0	4	0	1	5
	Grade2	18	92.9	7.1	0.0				
	Grade 3	15	100.0	0.0	0.0				
	Grade 4	16	91.7	8.3	0.0				
	Grade 5	0	0.0	0.0	0.0				
	Grade 6	0	0.0	0.0	0.0				
Primary School 2	Grade 1	94	79.3	8.5	12.2	10	0	4	13
	Grade2	70	87.7	7.1	5.2				
	Grade 3	70	94.6	1.2	4.2				
	Grade 4	79	90.6	0.0	9.4				
	Grade 5	77	84.2	2.1	13.7				
	Grade 6	72	83.5	1.3	15.2				
Primary School 3	Grade 1	123	83.1	11.3	5.6	9	1	5	11
	Grade2	103	90.5	0.0	9.5				
	Grade 3	93	92.5	3.4	4.1				
	Grade 4	117	90.4	4.6	5.0				
	Grade 5	85	90.0	2.2	7.8				
	Grade 6	81	94.2	0.0	5.8				
Primary School 4	Grade 1	111	85.2	7.8	7.0	2	3	1	7
	Grade2	116	61.9	6.2	7.8				
	Grade 3	74	93.8	6.2	4.1				
	Grade 4	71	80.5	7.8	38.0				
	Grade 5	62	58.8	0.0	27.4				
	Grade 6	47	95.7	0.0	25.6				
Primary School 5	Grade 1	82	77.9	13.0	9.1	1	3	0	5
	Grade2	66	87.5	8.3	4.2				
	Grade 3	69	85.3	9.4	5.3				
	Grade 4	65	80.8	12.1	7.0				
	Grade 5	30	79.9	6.7	13.1				
	Grade 6	30	76.6	8.3	15.1				

4.1.2.1.1.2 Lower Secondary Schools

Lower secondary school conditions were almost the same. There were some points that need to mention here.

Table 4.3. **A brief overview of the lower secondary school sample in 2009-2010**

Schools & Grades		Enrolled Children	Promotion Rate	Repetition Rate	Dropout Rate	Staff			Rooms
						Official	Contract	Non-teach	
Lower Secondary School 1	Grade 7	209	53.0	33.0	14.0	21	0	7	9
	Grade 8	165	53.0	33.9	13.1				
	Grade 9	160	76.0	21.0	3.0				
Lower Secondary School 2	Grade 7	62	87.1	0.0	12.9	10	0	7	8
	Grade 8	54	94.5	0.0	5.5				
	Grade 9	45	84.5	0.0	15.5				
Lower Secondary School 3	Grade 7	326	78.9	2.1	20.0	45	0	13	22
	Grade 8	227	85.1	0.4	13.7				
	Grade 9	265	81.5	0.0	18.5				
Lower Secondary School 4	Grade 7	128	80.7	0.0	19.3	17	0	5	13
	Grade 8	122	84.4	0.0	15.6				
	Grade 9	149	60.9	22.0	17.1				
Lower Secondary School 5	Grade 7	68	75.8	2.5	21.7	13	0	3	13
	Grade 8	211	78.3	2.3	19.4				
	Grade 9	97	67.1	10.3	22.6				

Note: The data presented in this table was taken from all sample schools directly. The statistics here is different from the one by EMIS and the real data collected by researcher during each fieldwork visit.

Lower Secondary School 1 could be considered as the best school among the five sample schools, though it had many difficulties running efficiently. It is around 71 kilometers away from the town center, but it stands at the river part of this province where most people can work whole year long on their plantations. In Cambodia, usually farmers

who do plantations are much better-off than the ones who depend on rice cultivation. Historically, this school was built in 2006. At first, it was attached to a primary school complex and started with only grade 7. In 2009, with assistance from an international organization with 10 percent of financial contributions from the community, two buildings of 10 rooms were established. In 2009-2010 academic year, 534 students were enrolled. They were divided into 5 classes of grade 7, 4 classes of grade 8 and 4 classes of grade 9. An average class size was 41.1 and pupil-teacher ratio was 25.4. Since it was a newly-founded school, many of its teachers were newly recruited and they possessed. As shown in Table 4.3, the numbers of teaching and non-teaching staff were 21 and 7 respectively. As regards the promotion, it had much lower rates, compared with other schools. This phenomenon was because of high repetition rates in all grades. Once looking at a passing rate of national exit exam for this school, one could see that almost 95% of its students who went for exam in 2010 passed. This high percentage was a result of a strict screening process at school level. It reduced a large number of low performing students from entering a nation-level exam. It had the lowest dropout rates among all schools. The highest rate was in grade seven, around 14.0%. The principal was enthusiastic in his work and ready to learn new things. He was pursuing his graduate study at a private university in the provincial town every Saturday and Sunday. His ways of leading a school were quite different from what happened in other sample schools.

Lower Secondary School 2 is very close to the town center, around 18 kilometers away. It was formed 2 years earlier than the first school. It shared a complex with a primary school. From its start in 2004, the numbers of enrolled children kept decreasing each year. In

2009-2010, there were only 161. Because of the small number of students but large number of teachers and classrooms, this school formed its 161 students into 6 classes which made an average class size to the smallest among all schools, around 27 students per class. The student-teacher ratio was just 16.1. At the same time, there were seven non-teaching staff members to run administrative work. All the students were reported to pass their grades in 2010, which made the repetition rates become zero (see Table 4.3). It was one of the schools that had high pass rates on the national exam. Its dropout rate remained high, though.

School 3 is located on the main road and it is very close to a small business center. Compared to all the five areas where schools stand, it is the richest area. Around 30% of its students came to school by motorbikes. Many private classes were abundant. That enabled its teachers to earn more than those in other schools. On the fieldwork visits, a few teachers drove cars to school, surprisingly. Historically, this school was established since 1980 and it used to be a high school which provided an educational service from grades 7 to 12. Once a new upper secondary school was constructed nearby in early 2000s, all of its upper-secondary students and teachers were transferred to that new school. Ever since, it became a lower-secondary school. It was the only school that had a big campus with a soccer field, volleyball court, basket court and many other sport facilities. Unlike other sample schools, it had a library and it received 15 computers from an international organization. However, students were asked to pay some fees if they wanted to study computer skills. It was reported that the school could not afford the high price of electricity if the courses were provided free of charge. It was the largest school in terms of students. In 2010, it received 818 students, who were segmented into 22 classes. As a result, it had an average

student-class ratio of 37.2 and student- teacher ratio of 18.2. Because of a wide variety of private supplementary classes, it had low repetition rates and its pass rate on grade-nine national exam in 2010 was 96.4%. This school used to have an outstanding student who won the first place of mathematics in a national competition. Since many staff members were allocated for administrative and managerial work, it was smoothly operated. Though facility and management conditions were immaculate, dropout rate was still a big challenge. Through interviews with the principal and vice-principals, they ascertained that they had visited at-risk students' homes and persuaded their parents to send them back to school. Most of the scholarship students dropped out in this school.

Lower Secondary School 4 is around 108 kilometers from the town center but it was only 6 kilometers off the main road. It is located near a provincial line between Kampong Cham and Kandal Province. Because there is a fancy secondary school of Kandal Province standing around 3 Kilometers from School 4, some of its students asked for transferring permission to that fancy school. Until 2010, 339 students remained inside this school. Those students were divided into 10 classes and 17 teachers were assigned to be in charge of their learning. Most of the teachers were in position more than 20 years on average but their education levels were the lowest among the five schools. Dropout and repetition rates were so high and its passing rate for the national standard exam for grade nine was so low. The interviews with district officer of education revealed that it was one of the schools that needed a prompt action to raise its quality of education provided.

Lower Secondary School 5 stands 46 kilometers away from the town and it is around 26 kilometers off a tarmac road. It was built since 1980 but there was only one

wooden building with 3 rooms. In 1998, it received fund from a political party to construct two concrete buildings. Because of its remoteness and high dropout rates, in 2010, USAID built a computer lab so that it could attract more students to school. The computer lab consisted of 20 computers, all of which were run by solar-system power. Until 2009-2010 academic year, it received 376 students. As shown in Table 4.3, there was a sudden decrease in the number of enrolled seventh-graders. In grade 8, there were 211 students whereas the number of seventh-graders was only 68. It was told that a new lower-secondary was constructed to reduce a commute distance of students. Hence, students from 4 villages were a quota for that new school, which started in 2009 with seventh grade classes only. An average pupil-teacher ratio was 28.9. It was the highest among all schools. It also ranked high in terms of dropout rates. On management matters, it had no real principal since 2006. There was an acting principal but he had never been promoted as a principal until 2011, when my last fieldwork was carried out.

4.1.2.1.2 Students

In the first year of the study, the researcher received distributed questionnaires and carried out interviews with 568 primary-school students, of whom 282 were in grade one and 286 were in grade four. Those students were included by means of stratified random sampling. However, numbers of students from each school were not equal, since school sizes varied. In Primary School 1, only 43 students (20 girls) were available for study, whereas the numbers of sample students from Primary Schools 2, 3 and 4 hit to 148, 150 and 135 respectively. Practically, two classes of first-graders and four-graders were included. As shown in Table 4.4, the number of sample reduced each year. To the end of the study,

remaining numbers dwindled to only 202 for cohort 1 and 162 for cohort 2. However, due to the fact that six students from cohort 1 transferred out of the sample school, they were cut off, by the definition provided in Chapter One. Fortunately in cohort 2, only three students transferred out, based on documents provided by schools, and one student was reported dead in second year.

With regard to junior high schools, the same procedure of stratified random sampling was also applied. As a result, 337 grade-seven students, of whom 199 were female, were included. Around 60 students from each school had been planned to select for questionnaire filling, but during the first fieldwork, some schools had very small student-class ratios; hence, the researcher chose two classes. That decision resulted in a small difference of student sample from each school. Around 50% of the students left school earlier during the three years of their low-secondary education careers.

In total, 887 students participated in the students. In the first year, 122 students dropped out; this depleted the total sample number to 783. The number continued to diminish every year. At the end of observation period, there were only 519 survivors.

4.1.2.1.3 Teachers

In total, 113 teachers were interviewed to explore levels of their professional motivation and challenges as well as some other factors on individual students, schools and communities. Thirty six primary school teachers, of whom 17 were female, became research participants. All the teachers who taught the selected classes were included, plus other teachers who taught different classes. In lower secondary schools, 77 teachers who taught and did not teach the sample classes were selected.

Table 4.4. **Total number of sample students by year**

School	Sample		Dropouts by year						Survivors	
			1st Year		2nd Year		3rd Year			
	Total	Girl	Total	Girl	Total	Girl	Total	Girl	Total	Girl
Cohort 1 (Grade 1 ➜ Grade 2 ➜ Grade 3 ➜ Grade 4)										
Primary 1	20	09	0	0	0	0	0	0	20	9
Primary 2	63	25	2	0	2	1	4	2	55	22
Primary 3	52	22	9	4	5	1	11	5	37	12
Primary 4	59	23	1	0	6	2	9	5	43	16
Primary 5	78	32	4	2	9	3	15	7	50	20
Sub-total	282	111	16	6	22	7	39	19	202	79
Cohort 2 (Grade 4 ➜ Grade 5 ➜ Grade 6 ➜ Grade 7)										
Primary 1	23	11	0	0	0	0	0	0	23	11
Primary 2	85	44	8	5	5	3	15	7	57	29
Primary 3	88	45	8	5	12	6	13	8	55	26
Primary 4	76	43	18	15	20	11	19	11	19	6
Primary 5	14	4	2	0	1	1	3	1	7	3
Sub-Total	286	147	36	25	38	21	50	27	162	75
Cohort 3 (Grade 7 ➜ Grade 8 ➜ Grade 9 ➜ Grade 10)										
Secondary 1	66	34	7	4	6	3	9	4	44	23
Secondary 2	74	44	23	11	4	2	5	2	42	29
Secondary 3	63	39	9	5	18	13	7	3	29	18
Secondary 4	84	47	11	8	7	4	21	12	45	23
Secondary 5	50	35	16	12	15	11	5	3	14	9
Sub-Total	337	199	66	40	50	33	47	24	174	102
Grand Total	887	457	122	71	110	61	136	70	537	256

4.1.2.1.4 Principals

Though ten schools were included, only nine principals were available as the sources of information during the first year of observation. Primary School 5 was an incomplete school at that time. Only two teaching staffs (one was an officially appointed teacher and another was a contract teacher) were present and taught two multi-grade classes – a class of grades one and two, and a class of grades three and four. In second year, World Bank provided grant to establish a new school in that area. The officially designated teacher became a principal, since after. Also, in Secondary School 5, only acting principal was available.

4.1.3 Instruments and Implementation

4.1.3.1 Questionnaires

A student questionnaire of 25 questions was used to obtain information on individual students in grades 4 and 7, and their family conditions in the first year of data collection (Appendix B.1). Most of the questions were adapted from other well-developed instruments. For example, the questions on socio-economic status were adapted from OECD questionnaire. Some data was pooled from students' parents by a six-question questionnaire (Appendix B.2). Piloting was also carried out to find out mistakes or some misleading concepts, and problems with language use, answer choices, timing, procedure, and the like. Afterwards, some modification was made to the questionnaire and distribution procedures. From second year, the questionnaire was distributed to only cohort 3 students.

4.1.3.2 Interviews

Guided interviews were conducted with cohort-one students throughout the observation period, for they could not read and fill in questionnaires by themselves. Questionnaire framework was used as an interview checklist with some modification of language use to help them answer more accurately. In the first year, after the filled questionnaires were returned, during data input stage, it was found that a large number of grade-four students were not able to read and complete questionnaires properly; consequently, interviews were also carried out on the students in cohort 2 from the second year on. Another reason why the researcher opted for interviews on those students was because the cohort-2 students were mixed up with other students of the same grade, in some schools. Interviews were also held with teacher and principal to sharpen an understanding of their motivation levels, professional difficulties, and many other school factors (Appendix B.3). Those interviews were conducted within the framework set in interview checklist.

4.1.3.3 School Record Checklist

Checklist for school management was adapted from UNESCO framework (2008) which had been used to investigate managerial abilities of principals and their administrative staff in seven Asian countries (Appendix B.4). Another checklist for school quality was adopted from Lloyd, Clark, and Mensch (2000), who had conducted a study on relationship between school quality and dropout in Kenya. Some changes were made to fit the Cambodian context (Appendix B.5). Besides, qualitative observation was carried out to gain deep insights into school environment, school orderliness, and other school-related matters.

Other primary and secondary data was pooled at individual schools, district

offices of education, provincial departments, and relevant ministries. At school, annual school reports, school census reports, students' academic and absent records, students' profile records, teachers' profile records and other relevant documents were photographed and later transcribed. At district and province levels, data on conditions of villages in school catchment areas was collected.

4.1.4 Observation Period and Interval

Since this study needed panel data, first researcher collected data and after a certain period of time, and the researcher went to the fieldwork to check which subjects dropped out. Due to some personal reasons and high cost of travelling, the researcher was able to check schooling progress of sample schools once a year. Thus, it should be clarified that the observation interval for this study was counted on one-year base.

The first fieldwork was conducted on November 4, 2008, and it lasted one month. According to the Cambodian school calendar, all schools open for operation in early October; however, they are fully operational from November when there are few holidays. That was the reason why the researcher chose November as a starting point of the study. Very few students were absent from each class. During that period, questionnaires were distributed to seventh-graders and interviews were carried out on the first- and fourth-graders. Data on school and other community factors was also pooled at local level. One year later, the second fieldwork was undertaken from December 4, 2008 to January 27, 2009. There were several supplementary tasks over the first fieldwork; mainly the researcher needed to identify who had dropped out, transferred, repeated grades or been promoted to the next level. Every detail of sample students was recorded. The same set of questionnaires and

interviews were administered to students. After the first fieldwork some missing information could be observed. Some sample students were excluded, but for those who failed to fill in the questions on time-constant variables were noted down, so that in the second fieldwork, the researcher tried to obtain all the missing data from the sample. The same procedures were implemented for the third and fourth observations. This research project was fully completed in January 2011.

4.1.5 Variables and Their Measures

4.1.5.1 Dependent Variables

Unlike most of regression analyses or other statistical methods, survival analysis demands two different dependent variables. The first variable is usually named *status*. It indicated whether or not the subjects drop or die during the observation period of the study. In this study, *status* variable is built in accordance with survival analysis method. In this variable, if any student who had dropped out during the three year observation, they were given a value of 1. If they, nevertheless, continued schooling even after the observation was closed, they were coded 0. The second dependent variable was normally known as *event*. Its existence is to indicate when the *event* of dropout happens and when the observation closes. Since this study observed the dropout patterns of changes in three years and its observation was conducted on a one-year scale. The *event* variable was coded from 1 to 4. Simply explained, if a student left school in the first, second or third year, they were labeled 1, 2, or 3 respectively. The sample students who were given 0 in *status* variable were coded 4. This showed that they remained inside school after the observation was closed.

4.1.5.2 Independent Variables

All independent covariates (variables) were categorized into two different groups. The first group was called time-constant covariates. Those were the variables that did not change their value over time. For example, regardless of how many times we conducted interviews on a student's family ethnic status, the answer remained the same, for ethnicity of a person will never change throughout time. The second group was named as time-varying covariates. These were the variables whose values kept changing over time. A full description of their meanings and measures will be explained in the following section.

4.1.5.2.1 Time-Constant Covariates (TCC)

4.1.5.2.1.1 Variables at Individual Level

At this level, a number of variables need further description to fully comprehend meaning of statistical values presented in the upcoming finding part. On dummy-coded gender variable, a boy was codes 1 while a girl was labeled as group 2. Only two ethic groups could be observed in this study. Khmer students were given a value of 1, whereas Cham (Muslim Cambodian) students were coded 0. It should also be reminded that in preschool experience variable, 1 was given to those students who had experienced preschools or unofficial grade-one admissions. In areas where no kindergarten services available, motivated parents always ask for permission to unofficially register their children in grade one, when their wards are 4 or 5 years old. Then, 0 was given to students who never experienced such school readiness programs. (For a detail of coding and measure, see Table 4.2.3.)

4.1.5.2.1.2 Variables at Family Level

Only two covariates were considered as time-constant; that is a father's and mother's education level. These two variables were obtained by the answers from Questions 12 and 13 of student questionnaires and interview checklists (see Appendix B.1). If a student's mother or father had never attended schooling, 0 would be coded on this variable. Because most of rural Cambodian parents received some years of primary schooling, primary school education level was divided into two categories. A parent who attended grades 1-3 was given a value of 1. Those who could attend grades 4-6 of the primary school were coded 2. The parents with lower and upper secondary school education background were labeled 3 and 4 respectively. The parents with university education were coded 5. Because of a strong correlation between a father and mother's educational attainment, the researcher built an interaction term between these two variables. The new variable was named *parental education attainment*.

4.1.5.2.1.3 School and Community Level

Because of a small sample size of schools, it is impossible to include school predictors into cox regression models. Thus, a dummy-coded variable for each school or location were included. For instance, *School 1* variable represented the overall condition of School 1 or location around School 1. In analysis, *School 5* was used a reference group so that results from each school or location can be compared to that in/around *School 5*.

4.1.5.2.2 Time-Varying Covariates (TVC)

Some variables change their values over time. Say, up to year one, a student only experienced two times of repetition, but s/he repeated grade in year 2. The grade retention

experience value was changed in year 2. If a researcher ignores a change on some important sensitive variables, results received from their studies are somehow misleading and less informative (DesJardins, Ahlburg & McCall, 1998; Willette & Singer, 1991). Datasets of the three cohorts were examined and subsequently some variables were considered as time-varying or time-dependent variables (see Figure 3.1 for identification of those variables). Using the same method, a series of analyses were conducted with inclusion of the same sets of variables with or without time-varying values. Finally, it could be concluded by including time-varying covariates, all models were fit much better, which showed their importance levels of inclusion.

In cox regression equation, time-varying covariates were defined by using logical expressions. Logical expressions take the value 1 if true and 0 if false. Using a series of logical expressions, you can create your time-dependent covariate from a set of measurements. For example, in defining a time-varying covariate for repetition, a logical expression *(T_ < 1) * Rep1 + (T_ >= 1 & T_ < 2) * Rep2 + (T_ >= 2 & T_ < 3) * Rep3* was used. Simply explained, this function means that if time is less than one year, use Rep1; if it is more than one year but less than two years, use Rep2; and if it is more than two years but less than three years, use Rep 3. In such a case, it can be observed that the information dealing with *repetition* was collected three times and it was built into three different variables on SPSS sheet. Rep1 was the information on the number of repetitions students experienced before the first observation started. Rep2 was the information obtained at the second observation. In order to retrieve which dataset is to be used, *T_* function uses the *event* variable to make a judgment.

If a student dropped out at the first year, his/her information collected on the first observation was used. If they left school at the second or third year, their information collected on the second or third year was utilized respectively. Finally, if they remained in school when the observation was closed, the data pooled from them at the third years was included into analysis.

4.1.5.2.2.1 Variables at Individual Level

Academic achievement deserves a big space of description here. It is a kind of norm-referenced achievement, reported to students' parents in forms of ranks. The researcher was not able to administer a standard test to all sample students, since it is not the researcher's expertise. It requires skills and much time developing three different kinds of tests to be given to the three cohorts. The researcher, therefore, used an average score of the first three monthly test results from homeroom teachers when all students were fully involved in their academic affairs. For those students who dropped before the third month test began, for example, the researcher used mean scores of two, NOT three, monthly test scores. After each student received a mean score, dependent upon their length of stay in school in that academic year, the mean score was converted into a standard score in comparison with other students in the same class. A class mean was used to calculate that standard score. This kind of scores does not reflect students' actual achievement levels, but it states their ranks in class. It fits with an assumption that rural Cambodian parents may not be well-educated enough to measure schooling progress of their children but they would rely on the monthly ranks provided by teachers as a scale to balance a tradeoff between further

investment and putting them to work.

Several other variables were also included in analysis. Those were directly taken from questionnaire or interviews with students. Self-esteem scores were received from an addition of scores from two questions, one negative and one positive question, taken from Rosenburg (1965) with some modification to facilitate small children's understanding. Ages at first school entry to grade one, worth noting, were calculated by students' ages at that time minus the years of repetition, since a handful of students did not remember when they officially started grade one. Repetition experience itself was self-reported by students on the number of repetition in each of their earlier grades. Child labor was also included in this study. However, only the amount of time that students needed to spend helping their families, both inside and outside homes, could be collected. The researcher failed to include the types of work they performed to help their families. Other variables and their measures can be access through the questionnaire attached in Appendix B.1.

4.1.5.2.2.2 Variables at Family Level

There are four dummy-coded variables. As a principle of dummy variables, if a condition of a sample student is true with what a dummy variable is design to measure, a value of 1 is provided. If it is false, 0 is coded. It works the same way with the variables here. If a student was from a divorced family, s/he would be given 1 on *divorced parents* variable. It applies to other three dummy variables, *presence of both parents*, *decease of parent(s),* and *chronically ill members*.

Table 4.5. **Variables and their measures in the first year**

Variables	Measures/Instruments	Data type	Range
Individual Student Factor			
Gender (boys)	Student questionnaire (Q1)	Nominal	1-2
Preschool experience	Student questionnaire(Q5)	Ordinal	0-1
Ethnicity status	Student profile record from school	Nominal	0-1
Repetition	Student questionnaire(Q7)	Scale	
Absenteeism	Student questionnaire(Q8)	Ordinal	0-4
Educational Aspiration	Student questionnaire(Q10)	Ordinal	0-4
Doing homework	Student questionnaire(Q11)	Ordinal	0-4
Relationship with other students	Student questionnaire(Q27)	Ordinal	0-4
Relationship with teachers	Student questionnaire(Q28)	Ordinal	0-4
Self-esteem	Student questionnaire(Q4)	Ordinal	0-6
Academic achievement	Z-score of the first three monthly tests	Scale	
Late school entry	Student questionnaire(Q6)	Scale	
Self-reported health condition	Student questionnaire(Q3)	Ordinal	1-3
School distance	Student questionnaire(Q24)	Ordinal	0-4
Drug abuse	Student questionnaire(Q30)	Ordinal	0-4
Perceived local security	Student questionnaire(Q29)	Ordinal	0-4
Family Factor			
Family size	Parent questionnaire(Q19)	Scale	
Sibling order	Parent questionnaire(Q20)	Scale	
Presence of both parents	Student questionnaire(Q17, 18)	Nominal	0-1
Divorced parents	Student questionnaire(Q17, 18)	Nominal	0-1
Decease of parent(s)	Student questionnaire(Q17, 18)	Nominal	0-1
Father education background	Parent questionnaire(Q12)	Ordinal	0-5
Mother education background	Parent questionnaire(Q13)	Ordinal	0-5
Economic status	Regressed score of household items (Q15, 16)	Scale	
Parental aspiration	Parent questionnaire(Q14)	Ordinal	0-4
Family academic involvement	Student questionnaire(Q22)	Ordinal	0-4
Time helping family	Student questionnaire(Q23)	Ordinal	0-6
School Factor			
Dummied schools	School ID	Nominal	0-1

Family economic status was measured by possession of six items (cars, motorbikes, bicycles, cell phones, TVs and CD or VCD players), and availability of two household utilities (electricity and tap water). The reason why those items were used to represent household economic condition was that an asset-based approach for measurement of family economic condition has been claimed to be more consistent than income or consumption expenditure, because it uses uncomplicated and straight questions. As a result, it suffers less from memory limitation or social desirability bias (Sahn & Stifel, 2003). As mentioned by Berkman and Macintyre (1997), variables, such as wealth, savings, employment profit, or possession of homes, some vehicles or household items, are used in measuring economic status of the household. Due to complexity of questioning techniques dealing with wealth, employment profit and savings, most of recent studies used only possession of household items and vehicles (e.g. OECD, 2003) to estimate economic condition of household. This study adapted some of the items used in OECD questionnaires and added two important variables on possession of tap water and electricity. Possession of these two utilities was considered as a cutting point between the rich and the poor in Cambodia (National Institute of Statistics, 2005). As shown in Table 1, there were small variations on possession of cars, electricity and tap water. Less than 10% of households in this study had access to electricity and tap water, while 3% of them lived in families that possessed cars. Since some colinearity problems were found within these item variables, a factor analysis using *maximum likelihood* method with *Equamax* rotation was employed to group them. Three main factors were extracted. All of them were taken in the analysis (see Table 4.6). After examining outliers of each items and putting in each of them in reduced

models, together with the researcher's contextual understanding of what items should be well represent household wealth, only regressed scores from factor 1 was used to represent economic status of a family. This factor mainly consisted of three items – mobile phones, TVs and motor bikes. It should be noted that, of all sample students' families, less than 30 families possessed cars and 95% of the sample families possessed bicycles. It is not so wise to use these two variables to represent the wealth conditions of sample families. Possessions of the items from factor 1 were fairly distributed across sample. To some certain extent, this factor should be of high value for its representativeness.

Table 4.2.6. **The result of factor analysis on possessions of eight house items and utilities**

	Factor			Possession
	1	2	3	Percentage
Bicycles	.056	-.009	.605	94%
CD or VCD players	.218	.195	.332	48%
Mobile phones	.680	.347	.085	26%
TVs	.595	.050	.308	63%
Motor bikes	.849	.123	.149	43%
Electricity	.334	.655	.076	10%
Running water	.037	.455	.052	1%
Cars	.121	.718	.086	3%

4.1.5.3 Analysis Methods for the Main Study

4.1.5.3.1 Survival Analysis: Cox Regression

Cox regression was used to calculate hazard risks of dropout. This regression is commonly known as proportional hazard model. Instead of looking at survival curves, it

studies a contradictory side of the same coin; that is hazard. This regression model was first developed by Cox (1972). As mentioned in earlier parts, its popularity in social science arose in early 1990s. The hazard is basically modeled as:

$$h_i(t) = h_0(t) \exp^{(\beta_1 x_1 + \beta_2 x_{i2} + \beta_3 x_{i3} \ldots + \beta_k x_{ik})}$$

where $h_i(t)$ is a hazard at time *i* (in this study, it can be explained 'dropout at time *i*), $h_0(t)$ is a baseline hazard, β is a vector of coefficient that measure the effects of predictors x_1, x_2, x_3, … x_k. Cox regression was the only tool provided in SPSS to analyze survival data with multi covariates.

Kaplan Meier can also be used to analyze survival data with a single categorical covariate. The permit number of parameters for Cox regression, however, is up to 100, and this regression allows both categorical and scale data to proceed in a same analytical model. It should be noted that Kaplan Meier analysis was carried out to observe survival rate differences among schools in the three cohorts, as well.

4.1.5.3.2 Analytic Models

Due to the limited number of sample, seven models were set up to break a whole bunch of variables into small sub-domains. First, five time-invariant predictors dealing with student backgrounds were introduced into a model. All significant parameters were noted down, and afterward variables on student psychological states and behaviors were entered in the second model. In third model all variables at student level were analyzed. In the very next step of analysis, all student variables were removed from the model; then family resource and practice variables were replaced. In model 5, the researcher included all family variables. This analysis procedure enabled researcher to see separate effects of family-level

predictors, independently of student and school variables. Model 6 was built to see influence of school on dropout. As stated in the early section, Kaplan Meier analysis was also conducted to see patterns of differences in survival rates among school. Model 6 is a cross-check of the results obtained from Kaplan Meier. In the last model, all variables were included, except for the categorical school ID variable. The main reasons of its exclusion were (1) it manipulated itself into five more variables that increased analysis errors; (2) in primary school datasets, School 1 had 0% of dropout rate and School 4 consisted of all Cham students that made the dummy-coded School ID(4) variable had the same value as students' ethnic status.

4.1.6 Preliminary Analysis

This piloting study used Binary Logistic Regression, since an outcome variable was dichotomous, which took a value of 1 if a student dropped out in the first year of observation and 0 if s/he continued enrolling in second year. This analysis used only first-year data when only 16 first-grade students left school, for example. As will be stated below, a primary objective of this study is to reveal some significant parameters of school dropout so that more in-depth investigation on those matters would be pursued in the following-up years. The researcher employed Backward Likelihood Ratio method. This method allows researchers to see which variables are significant and need more investigation, which ones deserve no more attention and how those variables interact with one another in each step of the analysis. As a rule of this method, each variable is taken out from an equation based on its level of importance in a model itself. Until any further removal of

variables greatly affects the whole result, that step will be an ending step of analysis.

4.1.6.1 Findings

The result of logistic regression analysis using Backward Likelihood Ratio is shown in Table 4.7. There are some similarities and differences in causes of dropout from the three grades.

Table 4.7. **Causes of dropout by grades**

			95% CI for exp(B)		
	B	SE	Lower	Exp(B)	Upper
1st Grade (N= 269)					
Constant	-2.87	1.64		0.057	
Late school entry	0.36**	0.14	1.10	1.43	1.87
Fathers' educational attainment	-1.23**	0.46	0.12	0.29	0.73
4th Grade (N= 271)					
Constant	-5.55***	1.26		0.004	
Late school entry	0.54***	0.15	1.29	1.72	2.30
Repetition	0.51*	0.24	1.04	1.66	2.64
Ethnicity (Khmer)	-1.25**	0.41	0.13	0.29	0.64
Gender (Male)	-1.04*	0.43	0.15	0.35	0.82
7th Grade (N= 328)					
Constant	1.55*	1.38		4.72	
Repetition	0.91***	0.24	1.56	2,49	3.96
Family size	0.28*	0.11	1.06	1.32	1.64
Parental educational aspiration	-0.29*	0.11	0.60	0.75	0.94
Achievement	-0.04***	0.01	0.94	0.96	0.98
School 1	-0.85***	0.57	0.05	0.16	0.48
School 3	-0.75***	0.20	0.32	0.47	0.70
School 4	-0.33***	0.12	0.57	0.72	0.91

***Note**: * p<0.05, ** p<0.01, *** p<0.001*

In the 1st grade, late school entry (B=1.43) and father's educational attainment (B=0.29) were found significant. Of the two, late school entry seemed more interesting to study, because this can be solved by human effort in a short term, while father's educational attainment cannot be changed by any means. While late school entry was nominated as one

of the causes of dropout by the World Bank (2005), in this study, the effect size could be estimated. If a child entered school one year later, the probability for him to drop out would be 1.43 times higher. Seventy six point two percent of the children entered primary school over seven years old, and the average age of entrance in this sample was 8.12, counting that six years old meant from just six years to six years and eleven months. If they had entered school at the required age of six, the dropout rate would have decreased from 6.74% to 3.29%. Why late school entry is so common should be examined in further research. From the family perspective, the age of school entry had significant but very weak correlation with fathers' educational attainment (r=.219***) and the second economic status level (r=.167***), having the 1st to the 7th grade students in total. However, the correlation coefficient seemed to be too small to explain the phenomenon. It is likely that school factors also influenced late school entry. In most schools, the 1st grade classes were full with students, because of the high rate of repetition. On the other hand, in one of the five primary schools, all students entered at the age of six.

In the 4th grade, late school entry still strongly influenced the odds of dropout (B=1.72). Moreover, repetition appeared as one of the significant factors (B=1. 66). The two factors indicated together that the overage of children was one of the most important causes of dropout. This phenomenon could be explained by the well known law that the opportunity cost of education becomes higher as students' age goes up in many countries. For ethnicity and gender, the situation was quite difficult to generalize. All ethnic minority (Cham) students belonged to one sample school, and dropout of female students occurred more

frequently than males among Cham students. In the village where this school was situated, there was an Islamic school supported by a foreign NGO, but it was not officially recognized by the Cambodian government. Most dropouts continued actually studying in this non-formal school. They preferred to move to that school because it provided students with Arabic and Malaysian language courses, which might give them a chance to work in foreign countries in the future. In this research, from the definition, those who shifted from formal education to non-formal education were treated as dropouts, but it is not correct to criticize Cham people that they did not understand the importance of education in general or for girls. In fact, in the 1st grade, the dropout rate was lower among Cham rather than in Khmer in the sample. Maybe, Cham parents wanted their children to learn Khmer language in the early stage of their education. Then, they made their children move to a non-formal school, which they believed to be more beneficial for the children's future. However, these students were rather exceptional. Not all Cham had such alternatives. Further research should clarify how Cham students behave if there is no good non-formal school in a commutable distance.

In the 7th grade, influence of repetition was even stronger ($B=2.49$, $p<.001$). Achievement was detected to be strongly significant ($B=0.96$, $p<.001$). In this study, achievement was defined by average z-score of in-school tests for three months, so even B was close to one, the effect was quite large. Why high achieving students were less likely to drop out? The following can be an explanation. In Cambodia, as well as many developing countries, education is often considered as an investment. Parents and students themselves tend to make a decision on continuation of education if they can expect a high return on that

investment. High return means better job opportunity and higher income. It was probable that good achievement was conceived as the sign of expected high return, while repetition meant more cost for investment. Thus, in the stage of the 7th grade, as the opportunity cost of education had risen, students might have made a severer decision on cost and return of the educated. Other new factors which appeared in the 7th grade were schools. Those who attend School 1 tend to drop out much less ($B=0.16$, $p<.001$) than students of others schools. The same phenomenon was seen with students of school 3 ($B=0.47$, $p<.001$) and those of school 4 ($B=0.72$, $p<.001$). In order to identify which parts of schools form this huge difference, a qualitative study should be conducted. Family size ($B=1.32$, $p<.05$) and parental educational aspiration ($B=0.75$, $p<.05$) were also found significant, but the level of significance was not quite strong.

CHAPTER 5

THE FIRST STUDY:

SCHOOL DROPOUT AT BASIC EDUCATION IN RURAL CAMBODIA

Built on the method used in the first study, this study observed a pattern of changes in dropout characteristics by repeatedly observing the whole process for three years. It engaged three different cohorts to cover all grades of basic education in Cambodia. Rather than finding causes, this current study focused on when and how those causes started to have adverse impacts before the final dropout decision was made. It aimed at answering the following questions:

(1) What force rural Cambodian students to leave school so early?

(2) Are there differences between the causes of dropout by grades?

5.1 Descriptive Statistics and Correlation Matrix

5.1.1 Dropout Sample in Each Cohort

As shown Table 4.2.2, there were differences in dropout rates of the three cohorts. It was reported that most students did not drop out when they were in very low grades of schooling. Once their grades continued to be higher, their rates of dropout also started to enlarge, until it reached almost 20% in each grade of lower secondary school.

During three years of observation, 77 students (27.9%) left school in the first cohort. This percentage of 9.3% from grade one to three was quite similar to the national trend in rural areas (8.4% in 2011) (MoEYS, 2011). This was the newest statistic provided

by EMIS. However, if we traced back to the time when this study was conducted (from 2007 to 2011), the dropout rates in the last few years were slightly higher than the present one. Thus, it could be concluded that its rate of 9.3% was quite representative of most typical rural provinces in Cambodia. Of the total dropout sample, 32 students were girls, which accounted for 41.6%. Simply explained, more male students dropped out at lower grades of primary school.

In cohort 2, by the end of observation period, 124 students (43.9%) made school departure. This percentage was quite high, in comparison to the rate at national level. At grade four, 12.8% of sample students left school and never came back when the observation was closed. In grades five and six, the dropout rates started to soared up to 15.4% and 24.0% respectively. The main reasons why the rates became so high in grade five mainly the researcher also included those whose names were promoted to grade seven of lower secondary school but they never showed up in lower secondary schools as reported by the secondary school principals where those students were sent. As a result, the rates for this grade became high. At this level, the differences between the rates of girls and boys were quite visible. Girls started to leave school more than boys. In grade 4, out of 36 students who dropped out, 25 students (69.4%) were girls. In total, the dropout rate for girl students was 50.3% (of the total number of 145, 73 girl students dropped out in three years' time) whereas the boy rate was 37.2%.

In cohort 3, more and more students quitted schooling. At the end of observation, 163 (49.5%) students decided to end their educational careers. On average, around 16.5% of sample students dropped schooling each grade of lower secondary school. It seemed a little

bit lower than an average nation-wide rate (22.1%). Until these grades, the gender disparity in education access is not so vast. At this level of lower secondary education, around 49.7% of girl students discontinued their schooling while 47.8% of male students stopped schooling during the study period.

5.1.2 Descriptive Statistics of the Variables and Their Correlation Matrices

Table 5.1 depicts the means and standard deviations of all the variables included in cox regression analysis of the three cohorts. The statistics presented in this table were withdrawn from the data collected in the first observation and it excluded the time-varying values of some certain variables during the observation time.

From the statistics presented below, several interesting changes on could be observed. First, there were more girl students in the lower grades of schooling (*M=1.39, SD=.490)* as a male student was coded 1 and the girl was given 2. Then their disparity was narrowed down when they reached higher grades of primary school (*M=1.51, SD=.501)* and finally the enrollment of girls to lower secondary school turned slightly lower than that of the boys *(M=1.60, SD=.491)*. Second, it was found that students who experienced preschools tended to remain in school longer, as in the first cohort there were only 17% of sample students experienced this school readiness program and the percentages increased to 21% in cohort 2 and 23% in cohort 3. Though the differences were small but the popularity and availability of preschools were not the same among the present condition and the conditions four years and seven years ago. As mentioned in Methodology part, this study was conducted in 2007 on three different cohorts that the same time – the students in grades one, four and seven. The preschool condition of cohort-2 students was the condition four

years before 2007, for instance. An average age of first school entry became earlier when students were in higher grades, which implied that old students tended to leave school along their ways to the completion of basic education. On average, sample students commuted between one or two kilometer from home to school every day and they experienced repetition at least once during their school lives. As expected, when their ages grew, they needed to work longer hours to help their families; meanwhile their aspiration for further education and self-esteem became higher as well. Most of the sample students reported that they had very slow frequency of absences. The highest absence rate was reported in cohort 1 *(M=.88, SD=.957).*

At family level, the descriptive statistics showed that a Cambodian mother generally had slightly lower education than her spouse. The means of their education levels proved that this assumption was correct for all the three cohorts. As reported in Table 5.1, around 77% of rural Cambodian parents stayed in villages with their families (Cohort 1 *M=.76,* Cohort 2 *M=.77,* Cohort 3 *M=.78*). Around 10% of them got divorced and another 10% of households had deceased parents. The remaining percentages of them went to work in other areas while their children were staying with their relatives. The mean scores of sibling numbers of sample students in each cohort were quite consistent. Generally, each rural family had five children. Table 5.1 continued to highlight that as children were growing up, their parents were more involved and motivated in their schooling.

Table 5.1. **Descriptive statistics of the variables included in analysis by cohort**

Variables included in the analysis	Cohort 1		Cohort 2		Cohort 3	
	Mean	Std. Deviation	Mean	Std. Deviation	Mean	Std. Deviation
Sex	1.39	.490	1.51	.501	1.60	.491
Preschool experience	.17	.373	.21	.405	.23	.420
Age of first school entry	7.36	1.636	7.00	1.243	6.87	.984
Ethnic status of students	.22	.418	.27	.444	.07	.260
Distance to school	1.48	.556	.72	.760	1.29	1.396
Number of repetition	.63	.739	.76	.821	.56	.735
Academic achievement	0.009	0.983	0.010	0.990	0.029	0.981
Absenteeism	.88	.957	.69	.877	.69	.797
Homework	2.06	1.422	3.59	.778	3.36	.908
Time spent helping family	2.25	1.789	2.93	1.865	2.96	1.792
Desired level of education	2.00	1.180	2.81	1.072	3.09	.953
Self-esteem	3.48	1.451	3.94	1.214	4.12	1.192
Relationship with friends	2.56	1.002	3.11	.792	2.81	.851
Attitude toward teacher	2.63	1.155	3.42	.820	3.22	.815
Economic Status	-0.085	0.852	0.237	0.897	-0.106	0.877
Parental educational aspiration	1.81	1.020	2.76	1.071	2.47	.924
Family academic involvement	2.32	1.202	3.26	.943	3.25	.878
Level of father's education	1.24	1.061	1.65	1.240	1.84	1.322
Level of mother's education	.93	.845	1.32	1.122	1.59	1.217
Dummy for Presence of both parents	.76	.425	.77	.420	.78	.416
Dummy for Divorced Parents	.08	.266	.09	.280	.07	.260
Dummy for Deceased Parents	.07	.254	.10	.295	.13	.338
Number of siblings	4.78	1.588	5.27	1.662	4.73	1.661
Valid N (listwise)	276		282		329	

Table 5.2. **Correlation matrix of the variables included in regression analysis on cohort 1**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Age	-.175**	-.426***	.851***	.096	.056	.396***	.026	.241***	-.137*	.213***	.016	-.088	-.075	.173**	.074	.085	.003	.327***	-.223***	-.255***	-.261***	-.023	-.090
Sex (1)		.036	-.134*	.009	-.015	-.118	.076	-.175**	.142*	-.052	.023	.138*	.053	-.054	.099	-.036	-.044	.010	.027	.086	.052	.011	.189**
Preschool experience (2)			-.474***	-.241***	-.123*	.003	.093	-.187**	.097	-.047	.056	.060	.081	-.083	-.164**	.018	.032	-.152*	.096	.304***	.280***	.054	.012
Age of first school entry (3)				.146*	.045	.024	.048	.208***	-.089	.164**	.046	.028	-.053	.180**	.107	.129*	-.043	.247***	-.171**	-.229***	-.262***	.028	-.018
Ethnic status of students (4)					-.057	-.130*	.011	-.131*	.252***	.050	-.016	.182**	.177**	.257***	.217***	-.023	-.043	.031	.219***	-.054	-.046	-.011	.025
Distance to school (5)						.007	-.067	.063	-.065	.093	.053	-.023	-.037	-.061	.001	.048	-.002	-.028	-.008	-.112	-.089	-.014	.046
Repetition (6)							.005	.131*	-.141*	.145*	.002	-.211***	-.079	.013	-.047	.014	.078	.175**	-.159**	-.139*	-.107	-.011	-.089
Achievement (7)								-.051	.265***	.152*	.058	.090	.289***	.163**	.046	.080	.022	.086	.152*	.094	.106	-.004	.173**
Absences (8)									-.227***	.086	-.038	-.083	-.178**	.037	-.054	.094	.110	.114	-.148*	-.129*	-.200**	-.016	-.146*
Homework completion (9)										.082	.223***	.344***	.154*	.231***	.150*	-.061	-.133*	-.076	.240***	.176**	.225***	.128*	.265***
Time helping family (10)											-.012	-.060	.045	.013	.007	-.041	.001	.214***	.002	-.047	-.012	-.045	-.029

Table 5.2. **Continued**																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Education Aspiration (11)												.235***	.140*	.185**	-.027	-.036	-.049	.010	.090	.069	.026	.460***	.271***
Self-esteem (12)													.296***	.255***	.071	-.114	-.031	-.044	.134*	.064	.070	.213***	.345***
Relation with others (13)														.250***	.002	-.092	.077	.034	.129*	.064	.061	.057	.122*
Relation with teachers (14)															.043	.057	.063	.028	.091	.060	.028	.132*	.234***
Presence of both parents (15)																-.324***	-.456***	.111	.088	.002	-.048	.023	.082
Divorced Parents (16)																	-.078	-.055	-.058	.027	.041	-.027	-.064
Deceased Parents (17)																		.002	-.105	-.155*	-.095	-.062	-.083
Number of siblings (18)																			-.177**	-.187**	-.134*	-.059	-.099
Economic status (19)																				.283***	.272***	.007	.219***
Father's education (20)																					.611***	.202**	.178**
Mother's education (21)																						.161**	.234***
Parents' education aspiration (22)																							.464***

Table 5.3. **Correlation matrix of the variables included in regression analysis on cohort 2**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Age	-.087	-.306***	.584***	.033	.227***	.348***	-.140*	.146*	.047	.120*	-.080	-.138*	-.003	-.075	-.011	-.039	.124*	.102	-.092	-.212***	-.277***	-.195**	-.159**
Sex (1)		-.050	-.086	.063	.113	-.070	-.064	-.075	-.058	.125*	-.012	-.165**	-.049	.007	-.120*	.093	-.021	-.109	-.047	-.147*	-.075	-.058	-.125*
Preschool experience (2)			-.431***	-.309***	-.080	.043	.133*	-.061	-.047	-.022	.130*	.098	-.040	.049	-.018	-.029	.043	.017	.069	.270***	.276***	.191**	.130*
Age of first school entry (3)				.090	.136*	-.192**	-.032	.029	.066	.091	-.043	.028	.184**	.035	-.014	-.072	.068	.055	-.044	-.185***	-.258***	-.080	-.006
Ethnic status of students (4)					-.095	-.133*	-.006	.095	.106	-.177**	-.267***	-.128*	-.128*	-.167**	-.110	.101	-.062	-.139*	.278***	-.178**	-.211***	-.382***	-.125*
Distance to school (5)						.069	-.053	-.022	-.007	.098	-.012	.055	-.042	-.006	-.008	.044	-.024	-.070	-.141*	-.019	-.070	-.087	-.004
Repetition (6)							-.091	.183**	-.100	.060	.066	-.175**	-.226***	-.118*	.006	-.050	.037	.095	-.118*	-.083	-.070	-.013	-.066
Achievement (7)								-.161**	.136*	.147*	.129*	.148*	.050	.057	-.015	.027	-.087	-.046	.035	.023	.111	.095	.137*
Absences (8)									-.077	-.086	-.172**	-.165**	-.047	-.120*	-.152**	.151*	.115	.036	-.036	-.069	-.079	-.172**	-.148*
Homework completion (9)										.116	.133*	.109	.191**	.061	.084	-.051	-.060	-.017	.056	.025	-.002	.094	.102
Time helping family (10)											.062	.144*	.080	.025	-.022	-.117*	-.006	-.027	-.180**	-.133*	.056	.076	.058

Table 5.3. **Continued**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Education Aspiration (11)												.098	-.004	.163**	.095	-.041	-.089	-.031	.045	.111	.119*	.384***	.203**
Self-esteem (12)													.211***	.194**	.050	-.006	-.053	.013	.144*	.076	.006	.106	.141*
Relation with others (13)														.195**	.046	-.028	-.016	.017	.031	.127*	.047	.113	.175**
Relation with teachers (14)															-.010	-.033	-.021	.088	-.037	.047	.057	.051	.102
Presence of both parents (15)																-.351***	-.601***	.247***	.031	.176**	.088	.109	.077
Divorced Parents (16)																	-.099	-.119*	.002	-.109	-.077	-.108	-.138*
Deceased Parents (17)																		-.126*	-.127*	-.103	.003	-.049	-.064
Number of siblings (18)																			.062	.020	-.149*	-.066	-.057
Economic status (19)																				.053	.019	-.032	.011
Father's education (20)																					.541***	.229***	.235***
Mother's education (21)																						.205***	.210***
Parents' education aspiration (22)																							.415***

Table 5.4. **Correlation matrix of the variables included in regression analysis on cohort 3**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Age	-.100	-.269***	.447***	-.067	.199***	.457***	-.299***	.131*	-.185**	-.061	-.307***	-.178**	-.043	-.101	-.080	.131*	.086	.141*	-.192***	-.182**	-.228***	-.184**	-.173**
Sex (1)		.019	.017	.017	-.093	-.174**	.134*	-.056	.065	-.010	-.076	-.095	-.005	-.071	.127*	-.126*	.007	.019	-.015	-.023	.031	.006	-.094
Preschool experience (2)			-.119*	.210***	-.184**	-.128*	.220***	-.180**	.109*	-.017	.157**	.159**	.067	.150**	.081	-.069	-.082	-.029	.156**	.161**	.143**	.001	.161**
Age of first school entry (3)				-.058	.001	-.173**	-.040	.080	.047	.018	-.095	-.052	.058	-.170**	-.093	.109*	.079	.059	-.240***	-.239***	-.236***	.047	-.076
Ethnic status of students (4)					-.158**	-.023	-.016	-.096	-.023	.051	.073	-.038	.102	.184**	.009	.011	-.074	.032	.018	-.001	-.010	-.053	.041
Distance to school (5)						.049	-.207***	.154**	-.046	-.041	-.154**	-.052	-.001	.045	.025	-.007	.030	.047	-.105	-.085	-.124*	.029	-.077
Repetition (6)							-.211***	.099	-.261***	-.072	-.212***	-.076	-.097	-.049	.018	.041	-.013	.052	-.078	-.018	-.034	-.182**	-.110*
Achievement (7)								-.168**	.249***	.027	.330***	.200***	.223***	.120*	.094	-.042	-.096	-.104	.143**	.016	.055	.231***	.134*
Absences (8)									-.126*	.001	-.045	-.067	-.157**	-.047	-.024	.036	.026	-.022	-.026	-.101	-.104	-.081	-.095
Homework completion (9)										.031	.295***	.067	.206***	.235***	.094	-.023	-.096	-.040	.040	-.016	-.001	.150**	.162**
Time helping family (10)											.118*	-.009	.026	-.049	-.007	.006	-.002	-.060	-.035	.006	.010	-.038	-.052

Table 5.4. **Continued**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	Family academic involvement
Education Aspiration (11)												.136 *	.140 *	.291 ***	.125 *	-.111 *	-.092	.045	.242 ***	.185 **	.196 ***	.402 ***	.274 ***
Self-esteem (12)													.085	.143 **	.053	-.008	-.054	-.053	.106	.049	-.023	.108	.118 *
Relation with others (13)														.339 ***	.013	.020	-.022	.012	.003	.004	-.004	.133 *	.037
Relation with teachers (14)															.160 **	-.074	-.147 **	.165 **	.069	.070	.066	.032	.164 **
Presence of both parents (15)																-.385 ***	-.726 ***	.222 ***	.220 ***	.155 **	.143 **	.071	.192 ***
Divorced Parents (16)																	-.109 *	-.187 **	-.119 *	-.178 **	-.145 **	-.040	-.065
Deceased Parents (17)																		-.105	-.165 **	-.109 *	-.128 *	-.029	-.181 **
Number of siblings (18)																			.155 **	-.018	.018	-.150 **	.090
Economic status (19)																				.227 ***	.260 ***	.058	.252 ***
Father's education (20)																					.666 ***	.095	.124 *
Mother's education (21)																						.071	.207 ***
Parents' education aspiration (22)																							.272 ***

5.2 Model Fitness after Inclusion of Time-Varying Repressors

It is inappropriate to assume that what have adverse impacts on dropout decisions are unchanged throughout K-12 education level. It is, as well, impractical to presume that all effects of significant factors are invariant. By understanding these natures of dropout process, two series of analyses were carried on each cohort. First, researcher built models that used only time-constant covariates (TCC) and then models with time-varying covariates (TVC). After the analyses, model fitness statistics (-2 Log Likelihood) showed a significant improvement in all TVC models over TCC models (see Appendix C1-C6). For example, in the last model of each cohort, -2 Log Likelihood (-2LL) became much smaller when TVCs were included. In regression, the smaller a value of -2LL is, the better fit a model is. In model 7 of cohort 1, the -2LL value of TCC model is 768.23 when it is just 705.72 in TVC model. Every TVC model in each cohort is better fit than TCC model. It is, hence, unrealistic to ignore effects of time-varying predictors when studying dropout phenomenon. Results of TVC models are preferred in this study, and will be used for interpretation (see Appendix C1-C6).

5.3 Results from Cox Regression Analysis

5.3.1 Cohort 1 Results

Table 5.5 shows results of TVC models that predict possible causes of school dropout in rural Cambodia, whereas the results of TCC models are reported in Appendix C2. Though there are some differences in coefficient values and number of significant variables in a few models, some consistencies can be observed from these two tables.

5.3.1.1 Individual Student Level

From Model 1, results indicated that students who entered schooling late were at higher risk of dropping out. Even after a tight control of other variables, its influence remained statistically significant in the final model. Statistically, one-year increase in the age of a student's first school entry would accelerate the dropout possibility by 1.278 times. Simply explained, if the dropout rate of the students who started their first grade at the age of six was 10%, those who started schooling at the age of 7 would 12.78% (10% x 1.278). In this cohort, most of the students entered schooling when they were 6, 7 or 8 years old (*M=7.37, SD=1.63*). On average, the sample students were first enrolled in grade one around 1.37 years later than the required age. Around 8% of the students entered grade one at the age of five. Officially, five-year old students are not allowed to be admitted to grade one. Some motivated parents sent their children to school earlier with some compromising with school principals or in some cases, a student's birth date was modified. Ten percent of sample students or so were enrolled in grade one for the first time at the age of 10 or older. Most of these students were no longer in school after three years of observation.

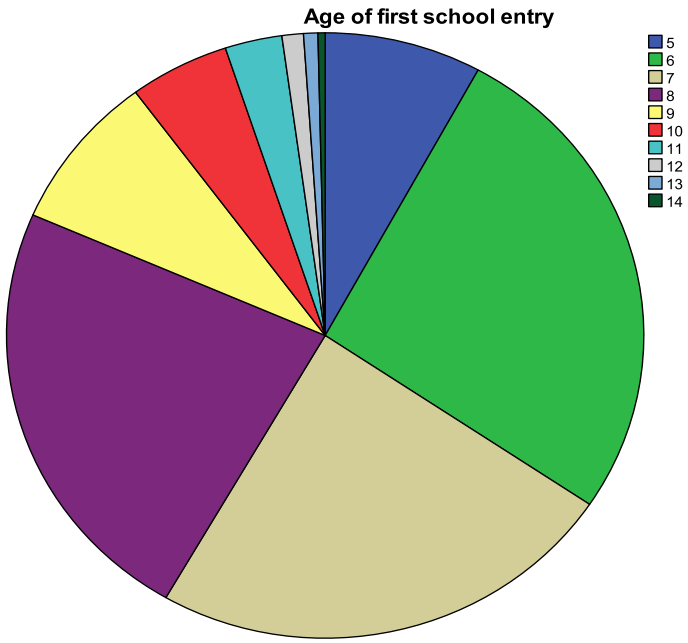


Figure 5.1. **The ages of first school entry in cohort 1**

Table 5.5. **Estimates of dropout with TVC models for cohort 1 (Grades 1-3)**

	Model 1			Model 2			Model 3			Model 4		
	B	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios
Gender	-.370	.271	.690							-.327	.289	.721
Preschool experience	.875	.754	2.399							.842	.760	2.322
Age at first school entry	.290***	.073	1.336							.246**	.078	1.278
Ethnicity	-.172	.302	.842							-.315	.317	.730
Commute distance	.272	.214	1.312							.292	.223	1.339
Repetition	.028	.138	1.029							-.026	.142	.974
Relative Achievement	.041	.145	1.042							-.047	.155	.954
Absences	.392**	.142	1.481							.365*	.147	1.440
Homework completion	-.150	.100	.861							-.111	.103	.895
Time helping family	.047	.073	1.048							.071	.075	1.073
Education aspiration	-.113	.114	.893							-.108	.125	.898
Self-esteem	.052	.093	1.053							.116	.097	1.123
Relationship with others	-.479**	.148	.619							-.438**	.151	.645
Relationship with teachers	-.037	.119	.963							-.037	.121	.964
Family economic status				-.245	.165	.137				-.224	.196	.800
Parents' education aspiration				-.132	.125	.291				-.057	.133	.944
Academic support from family				-.131	.110	.234				-.070	.123	.933
Parents' educational Attainment				-.111	.070	.112				-.046	.074	.955
Present of both parents				.018	.301	1.018				-.119	.349	.888
Divorced parents				1.294***	.295	3.646				.918***	.320	2.503
Parentless				.382	.460	1.465				.427	.523	1.533
Family size				.066	.077	1.068				.030	.094	1.030
School ID												
School ID(1)							-13.442	304.300	.000			
School ID(2)							-1.135**	.401	.321			
School ID(3)							.137	.278	1.147			
School ID(4)							-.349	.313	.706			
-2 Log Likelihood	721.13			800.90			815.80			705.72		

Note: **p < .05, ** p< .01, *** p< .001*

The results from cox regression also continued to show that students who were frequently absent from class had 1.440 times of dropout odds higher than did regular students. As Table 5.1 indicated, compared with students in other cohorts, the students in the first cohort seemed to have little higher frequency of absences with a wider disparity (*M=.88, SD=.957).* From the correlation analysis results reported in Table 5.2, students' absences were strongly correlated with their ages (*r=.241, p<.001)* and their reported homework completion frequencies (*r= -.227, p<.001*). It can be explained that the older students tended to have irregular class attendance, and because of their absences, they were not able to complete the homework tasks assigned by the classroom teachers.

High quality of student-student interaction inside school or classroom was strongly associated with high survival rates of students in this cohort, with an odds ratio of .645. Statistically, if there is one-level increase in a student's relationship with others inside school, it will reduce his or her dropout probability by .645 times. With reference to the results of preliminary study and TCC model, where it was found insignificant, it could be concluded that this good interaction was markedly important when they reached grades 2 and 3. For example, when the researcher used the first year data, preliminary study could not detect its significant influence. In TCC model, its relationship was so poor (see Appendix C2). Once, the different values of this predictor over time were considered and its influence was clear. It is deemed necessary that schooling experience must be enjoyable, fun and fear-free for them, so that they are more motivated to attend school on a regular basis. By and large, Cambodian children are passive and easily intimidated. Without helpful friends at school, they view schooling as a boring, insecure, and lonely experience, which forcibly

pushes them out of school.

5.3.1.2 Family Level

Model 2 was built to measure influences of family variables within their own boundary. First, four predictors were introduced into a model and then all were included. The results revealed that students from divorced families had hazard rates of dropout 2.5 times higher than the students from normal families. In this study, only eight percent of sample students were from divorced families and the correlation matrix tables showed weak and insignificant relationship of this predictor with other variables included in analysis.

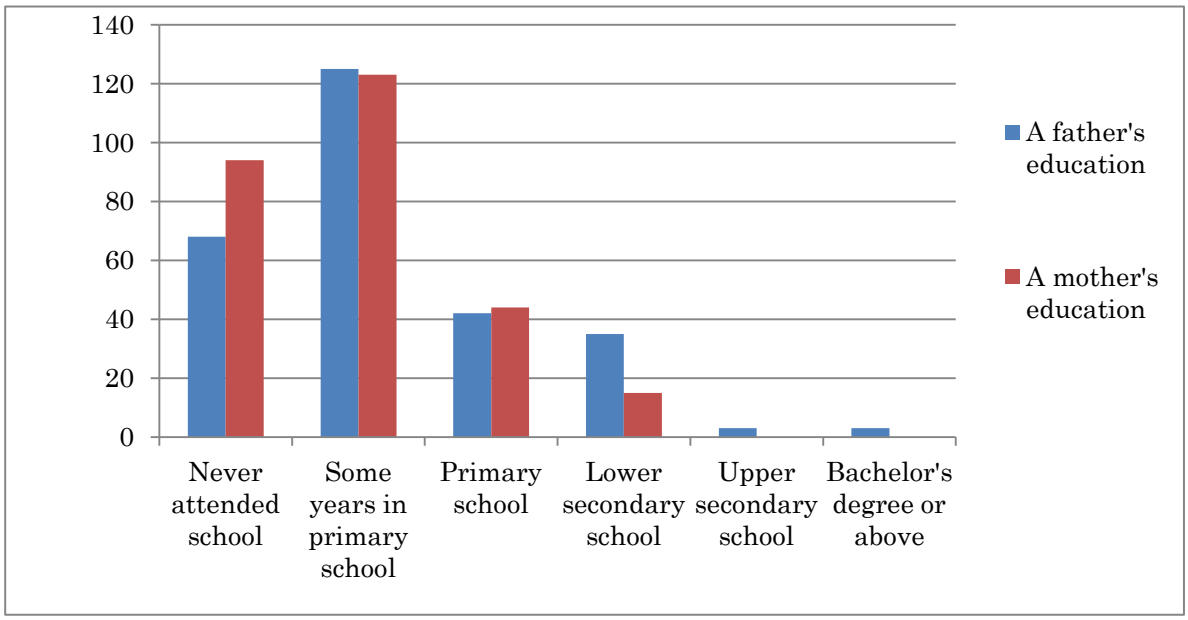


Figure 5.2. **The distribution of a father's and mother's education level in cohort 1**

Further relationship between some of important family predictors and significant variables at individual level was further explored. From correlation analysis, it could be observed that to some certain extent, parental education background indirectly influenced on

dropout through late school entry and class attendance. It was found that a student whose mother and father had high level of education background tended to send their children to school earlier ($r = -.229, p < .001$ for a father and $r = -.262, p < .001$). Highly-educated parents were seemed to send their children to school on a more regular base. They might see the importance of education for their children's future welfares. The reason why the impacts of parental education background were not clearly visible might be because there was not much variation in the education levels of most Cambodian parents. As reported in Figure 5.2, there were no sample students whose mothers graduated from upper secondary school or higher. Most rural Cambodia parents received some years of primary schooling but they could not stay till they had completed primary school. Some large percentages of them never attended schools at all.

5.3.1.3 School Level

As it was already explained in the analysis method part, School ID was used to build dummy-coded variables to represent school and community variables. Cox regression proved that some school and community variables could contribute to high odds of school dropout. In comparison to School 5, students in School 2 seemed to have significantly lower dropout probability. Because no dropouts were recorded in School 1, Cox regression ignored its importance in reducing dropout though this school showed much lower dropout possibility. However, it could be estimated that students in School 1 tended to seek for further education 13.44 times higher than students in School 5. Kaplan-Mieir analysis was also carried out. It was proved that there was strong significant difference in survival rates

among schools or locations where each school stood, as reported in Table 5.6. By observing survival rates, one can conclude that students in Schools 1 and 2 had lower hazard risks while School 3 and 5 had the highest risks (see Figure 5.3).

Table 5.6. **Survival rates of all schools in cohort 1 and Kaplan Meier statistics**

School ID	Total N	N of Dropouts	Censored		Overall comparisons	
			N	Percent	Log Rank	Breslow
1	18	0	18	100.00%	21.347	21.286
2	63	8	55	87.30%	*(.000)*	*(.000)*
3	60	24	36	60.00%		
4	59	16	43	72.90%		
5	76	28	48	63.20%		
Overall	276	76	200	72.50%		

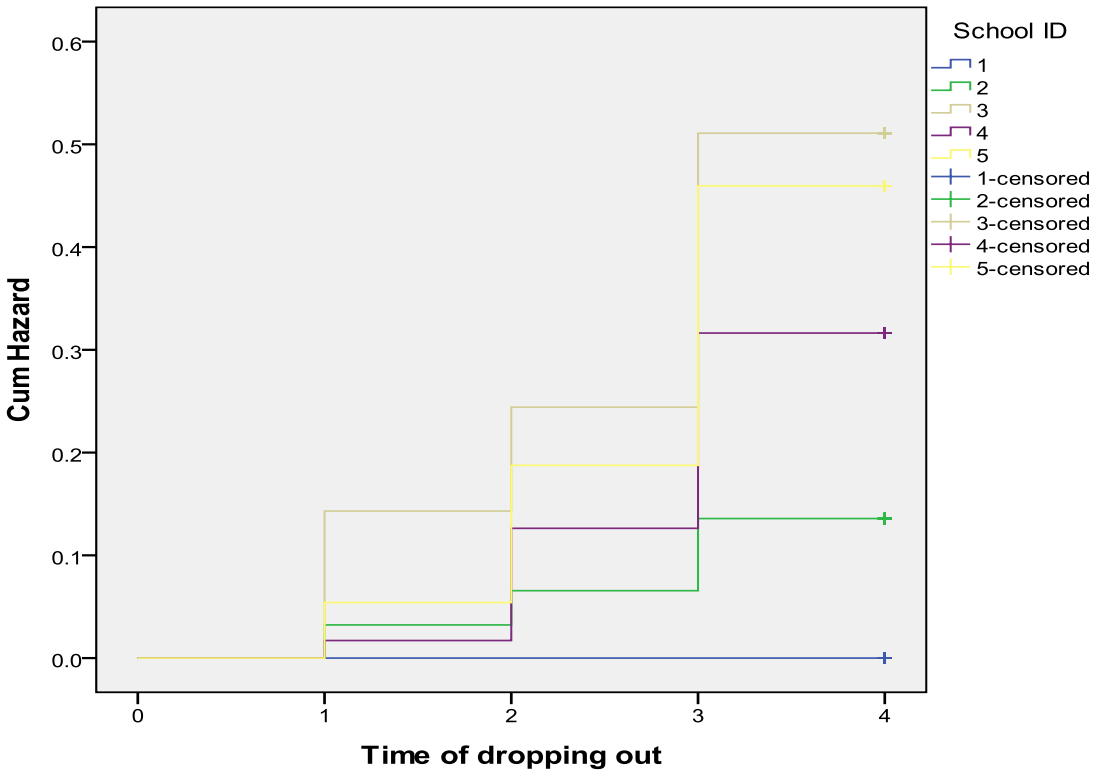


Figure 5.3. **Estimated hazard function for schools in cohort 1**

5.3.2 Cohort 2 Results

5.3.2.1 Individual Student Level

The results in Table 5.7 illustrated some consistencies of findings between cohort 1 and 2. Late school entry remained influential. It influence weight was very similar, though slightly lower, to that in the first cohort. It was calculated that if a student started their first official grade one year later, they would have 1.215 times of dropout hazard rates higher than a normal student who enrolled on time. Meanwhile, heavy absenteeism continued to generate its negative impact over rural children's schooling. Its ratio was quite similar to the one in cohort 1.

Several new factors significantly affected rural Cambodian students' schooling. The statistics in Table 5.7 showed that the students who never experienced preschool had 2.991 times higher dropout ratios than those who underwent it. Actually, its influence started since cohort 1 but it was not able to hold statistical significance level. In cohort 1, it had a hazard ratio of 2.332. In this cohort, according the descriptive represented in Table 5.1, 21% of students experienced preschool. As explained in the *variables and their measures* part, preschool experience could be location-specific characteristics or a variable that represented parents' awareness of educational importance. In this higher level of primary school, Khmer students (majority group) tended to stay in schooling longer than Cham students (minority Muslim group). Simply, school dropout likelihood of Cham students was 2.571 times higher than that of Khmer students. Several possible reasons can well explain this phenomenon. First, Cham parents want their children to speak Khmer (the official language), to facilitate their living at the later stage of lives, such as doing business with the majority group with

outsiders. Usually, Cham people live in their own communities and speak their own language. Formal schooling is the only way to master the official language skills. This explains why the Cham children tend not to drop out in the first few years of schooling. Second, due to a language barrier, Cham fifth-graders tend to have lower achievement than the Khmers. Unfortunately, we did not administer a standard test to compare their achievement levels. However, we found that around 30 percent of Cham fifth-graders were not able to spell their own names correctly, though they could communicate in Khmer orally. Finally, religious schools attract Cham students from public schools when they are old enough. Those funded non-secular schools, not officially recognized by MoEYS, provide a variety of subjects, such as Malay, Arab, English and mathematics, though much time is allocated for teaching the *Koran*. Outstanding students are rewarded scholarships to pursue their studies abroad or overseas employment opportunities. It should be noted that Cham communities have substantially benefited from assistance from rich Islamic nations after the terrible persecution during the Khmer Rouge (Escott, 2000).

Results also continued to show that if a student was kept in the same grade for one year, it would increase their dropout probability by 1.32 times. More specifically, if their rate of dropout was 10% when they never repeated a grade, by experiencing one time of repetition, their rate would soar up to 13.2 %. The cross-tabulation table below informs that if students experiences repetition three times or more, hardly could they be able to survive in schooling, up to these grades. Maybe the school dropout and survival chances of the students experience one time of repetition were not quite different (for more detail, refer to Table 5.7).

Table 5.7. **Cross-tabulation between the number of repetition and dropout status**

		Dropouts and non-dropouts		
		Censored	Dropouts	Total
Number of repetition	0	74	40	114
	1	58	50	108
	2	22	27	49
	3	3	7	10
	4	0	1	1
Total		157	125	282

At this point of schooling, high achievement started to produce much risk reduction of school withdrawal. Simply explained, the students who performed better their classmates tended to remain in school longer. Since the achievement in this study was measured by the first three monthly test scores obtained from the homeroom teachers, it did not represent an absolute achievement. To a larger extent, it was a kind of relative achievement. It was proved that students who frequently completed their assigned homework and submitted to their teachers survived in schooling longer than those who did not. Students who were reported to have high self-esteem remained in school longer. In Model 1, self-esteem was not statistically significant but after controlling for the influences from family-level variables, it turned significant. Its relationship with predictors at family level will be investigated in the very later part.

Table 5.8. **Estimates of dropout with TVC models for cohort 2 (Grades 4-6)**

	Model 1			Model 2			Model 3			Model 4		
	B	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios
Gender	-.366	.205	.694							-.342	.212	.710
Preschool experience	1.120*	.485	3.065							1.096*	.488	2.991
Age at first school entry	.206**	.080	1.229							.195*	.084	1.215
Ethnicity	-1.079***	.220	.340							-.944***	.249	.389
Commute distance	.166	.121	1.181							.184	.123	1.202
Repetition	.274*	.125	1.316							.251*	.128	1.285
Relative Achievement	-.491***	.102	.612							-.484***	.105	.616
Absences	.169*	.085	1.184							.173*	.087	1.189
Homework completion	-.275*	.111	.759							-.281*	.114	.755
Time helping family	.056	.053	1.058							.066	.054	1.068
Education aspiration	-.037	.081	.964							.006	.095	1.006
Self-esteem	-.153	.083	.858							-.182*	.085	.834
Relationship with others	-.013	.136	.987							-.005	.143	.995
Relationship with teachers	-.066	.103	.936							-.062	.105	.940
Family economic status				.102	.103	1.107				.114	.116	1.121
Parents' education aspiration				-.303***	.090	.739				-.101	.100	.904
Academic support from family				-.177	.097	.838				-.004	.101	.996
Parents' educational Attainment				-.066*	.030	.936				-.018	.031	.982
Present of both parents				-.015	.334	.985				.006	.321	1.006
Divorced parents				-.064	.369	.938				.100	.357	1.106
Parentless				.399	.401	1.490				.085	.431	1.088
Family size				.001	.056	1.001				.026	.061	1.027
School ID												
School ID(1)							-13.425	224.075	.000			
School ID(2)							-.543	.423	.581			
School ID(3)							-.386	.416	.680			
School ID(4)							.538	.401	1.713			
-2 Log Likelihood	1233.70			1328.06			1317.07			1230.12		

Note: **p < .05, ** p< .01, *** p< .001*

5.3.2.2 Family Level

In Model 2 of the analysis, high parental education level helped reduced the dropout possibility of a student by .936 times. However, after the predictors at individual level were included, it was no longer important and its hazard ratio was largely reduced. As the condition in the first cohort, most Cambodian parents attended some years of primary schools or never attended schooling at all. Further analysis was conducted. It was found that it directly influenced dropout decision via preschool experience and late school entry. Parents with high education background, regardless of how rich or poor they were, they enrolled their children to preschool if this school readiness program was available in their community schools ($r=.270$, $p<.001$ for a father and $r= .276$, $p<.001$ for a mother). They also tended to enroll their children into school early ($r=-.185$, $p<.001$ for a father and $r= -.258$, $p<.001$ for a mother). Though a mother's education level had small variety in rural provinces but its influence was stronger than the one produced by a father's education level.

At this level, TVC models produced more interesting results. Parental aspiration for their children's education started to have negation impacts of the odds of dropout. By examining its coefficients in Model 5 of TVC and TCC models, parental aspiration's effect size turned larger as their children proceeded to higher graders (see results in Appendix C3 & C4). However, from Table 5.8, in Model 2, high parental aspiration for their children's education saved children from making their early school departures, with an odds ratio of .739 and coefficient *B* of -.303. When putting individual-level parameters in the final model, it coefficient *B* value dropped three time to only -.101. It turned to be no more significant. Like parental education, it indirectly affected dropout probability through late

school entry and absences. The parents with high education aspiration for their wards sent them to school when they reached the required age. High parental aspiration also meant high frequency of school attendance. Those motivated parents tended to push their children to attend the class more regularly.

5.3.2.3 School Level

Results from Kaplan Meier analysis showed that being in some schools or communities detrimentally affect children's schooling length. From Table 5.8 below, one could clearly recognize that staying in School 1 or communities around this school would help students persist in school longer, in comparison to other schools or communities. Being in School 4 lowered down the survival rates of children. Only 25% of its grade-four students could be estimated to complete primary school education. Its high hazard risks, thus, should not be overlooked.

Table 5.8. **Survival rates of all schools in cohort 2 and Kaplan Meier statistics**

School ID	Total N	N of Dropouts	Censored		Overall comparisons	
			N	Percent	Log Rank	Breslow
1	21	0	21	100.0%	56.760	54.595
2	84	28	56	66.7%	*(.000)*	*(.000)*
3	88	33	55	62.5%		
4	76	57	19	25.0%		
5	13	7	6	46.2%		
Overall	282	125	157	55.7%		

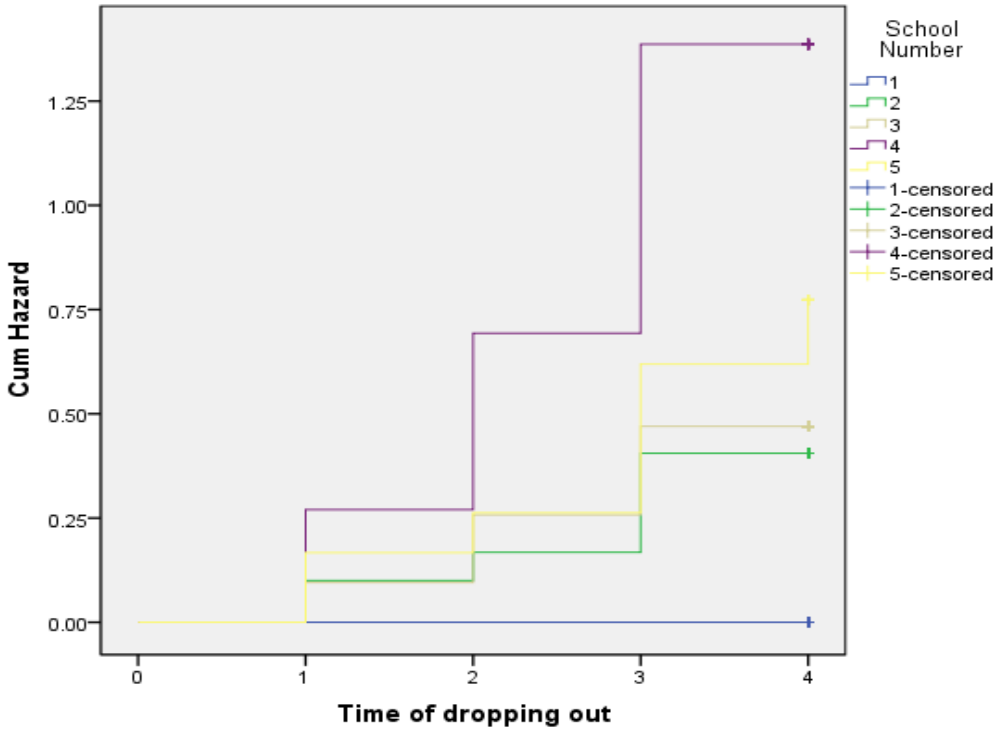


Figure 5.4. **Estimated hazard function for schools in cohort 2**

5.3.3 Cohort 3 Results

A large improvement could be seen by including TVCs. When in the last TCC model, -2LL was 1640.45. There was a hug reduction of 425 in value of -2LL in the TVC model. Hence, all interpretation here will be based on the statistics from TVC models (see Appendix C5 & C6).

5.3.3.1 Individual Student Level

Though there was a slight difference of their effect sizes and several significant predictors in cohort 2 disappeared, a consistency in the findings obtained. Lack of preschool experience, repetition, low relative achievement and self-esteem continued to have detrimental effects on children's length of stay in school. It should be noted that in

comparison with results in cohort 2, the effect size of preschool experience became so strong. In cohort 2, the dropout predictability difference between the students who experience preschool and those who had never was threefold; however, it was 6.636 times different in this cohort. It well explained the long-term influence of preschool or school readiness programs provided to students before they started their formal schooling.

Table 5.10. **Distribution of repetition numbers by cohort**

Number of Repetition	Cohort 1		Cohort 2		Cohort 3	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
0	94	34.1	114	40.4	183	55.6
1	104	37.7	108	38.3	113	34.3
2	60	21.7	49	17.4	27	8.2
3	18	6.5	10	3.5	4	1.2
4	0	.0	1	.4	2	.6
Total	276	100.0	282	100.0	329	100.0

TVC models, however, proved that an influential power of late school entry turned weaker, when the effects of changes in some sensitive variables were considered. They also highlighted a prominence of absence patterns over the observation period. That is, students who showed up in class irregularly were more likely to leave school early. Lastly, high self-esteem was a good sign for further schooling. It was predicted that an increase of one point over student self-esteem would reduce dropout rates by 0.864 times.

5.3.3.2 Family Level

In the family level blocks, results from TVC and TCC models were a bit different. In TCC equations, five predictors were tested significant, whereas TVC equations

could only detect three determinants. Similarly, high levels of family wealth, parental aspiration and academic support from family put students at an advantage in longer education opportunities. Two parameters turned insignificant in TVC models. In TCC models, it was proved that the students whose parents were divorced (B=0.901, *p*=0.036) and whose parent(s) passed away (B=0.988, *p*=0.040) were predicted to have higher hazard risks of dropout. Their influences however dropped greatly in TVC models. After observing descriptive statistics, it was convinced that it might be because (1) no parents perished during the observation period and (2) only 11 more families became divorced. Very little changes in these two variables were not strong enough to stand against the changes in parental aspiration and family's academic support. As shown in Tables 4.2.12 and 4.2.13, their coefficients changed greatly in TVC models (B=-0.249 for parental aspiration and B=-0.307 for academic support) in comparison with those in TCC models (B=-0.225 for parental aspiration and B=-0.216 for academic support).

Table 5.11. **Estimates of dropout with TVC models for cohort 3 (Grades 7-9)**

	Model 1			Model 2			Model 3			Model 4		
	B	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios	*B*	SE	Hazard Ratios
Gender	-.064	.202	.938							-.056	.215	.946
Preschool experience	1.968***	.466	7.158							1.893***	.468	6.636
Age at first school entry	.160	.091	1.173							.121	.097	1.129
Ethnicity	.141	.443	1.152							.151	.451	1.162
Commute distance	-.029	.065	.971							-.021	.068	.980
Repetition	.343**	.121	1.409							.348**	.124	1.416
Relative Achievement	-.232**	.106	.793							-.227**	.112	.797
Absences	.288*	.114	1.334							.251*	.120	1.285
Homework completion	-.108	.104	.898							-.100	.106	.905
Time helping family	-.014	.052	.986							-.016	.054	.984
Education aspiration	-.259*	.106	.772							-.201	.121	.818
Self-esteem	-.172*	.074	.842							-.146*	.074	.864
Relationship with others	.037	.136	1.038							.046	.135	1.047
Relationship with teachers	-.201	.139	.818							-.214	.146	.807
Family economic status				-.254*	.109	.775				-.099	.119	.906
Parents' education aspiration				-.224*	.090	.800				-.020	.115	.980
Academic support from family				-.297***	.086	.743				-.140	.112	.869
Parents' educational Attainment				-.028	.021	.972				-.012	.024	.988
Present of both parents				.393	.395	1.481				-.027	.429	.973
Divorced parents				.558	.417	1.746				.180	.490	1.197
Parentless				.568	.434	1.765				.059	.488	1.061
Family size				.060	.051	1.061				.058	.068	1.060
School ID												
School ID(1)							-1.093***	.276	.335			
School ID(2)							-.646**	.244	.524			
School ID(3)							-.439	.239	.644			
School ID(4)							-.651*	.234	.522			
-2 Log Likelihood	1219.95			1738.34			1787.34			1214.78		

Note: **p < .05, ** p< .01, *** p< .001*

5.3.3.3 School Level

Using School 5 as a reference school and/or community, it was clearly evident that staying in other schools and communities raised children's years of schooling length (see Table 5.12). These results were in line with the ones from Kaplan Meier. Children in School 5 tended to have the lowest survival rates while those in School 1 had the highest chance of schooling length. Hazard function analysis showed that School 5 had highest negative impact on its students (see Figure 5.5).

Table 5.12. **Survival rates of all schools in cohort 3 and Kaplan Meier statistics**

School ID	Total N	N of Dropouts	Censored		Overall comparisons	
			N	Percent	Log Rank	Breslow
1	65	21	44	67.7%	23.291	23.257
2	74	32	42	56.8%	*(p<0.001)*	*(p<0.001)*
3	62	34	28	45.2%		
4	78	38	40	51.3%		
5	50	36	14	28.0%		
Overall	329	161	168	51.1%		

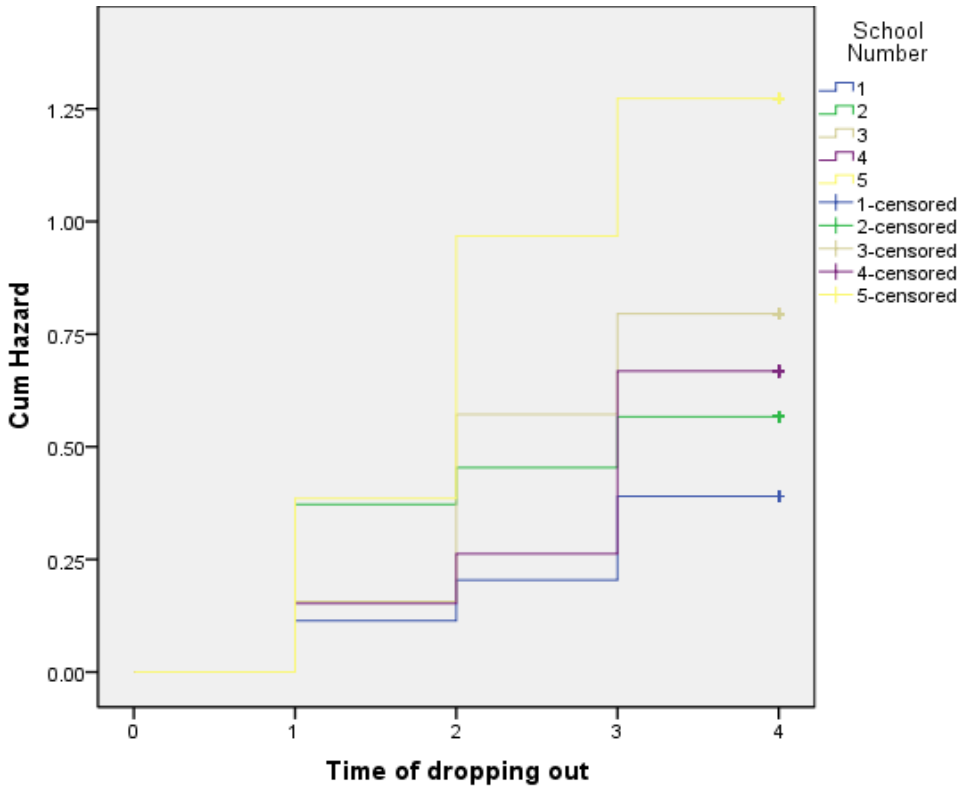


Figure 5.5. **Estimated hazard function for schools in cohort 3**

5.3.3.3.1 Discussion

Though dropout is an old story in a history of education development in Cambodia, it became more interesting and informative when it was retold by using a completely different way of telling. Event history analysis is one of the most appropriate methods that have been recommended by previous scholars was employed to investigate a dynamic process of school dropout in Cambodia. Three different cohorts of students were included in order to observe the dropout patterns by grade, which made the results very comprehensive and informative. Such a study is very useful for policy planning and implementation.

On student background domain, preschool experience was found significant in

reducing dropout rates in cohort 2 and 3. Since preschool education has not been popular in rural Cambodia, there is no single study focusing on it, though there is excessive global evidence of preschool education and later school outcomes and dropout (e.g. Barnett, 1995; Reynold et al., 2007). Preschool experience here included not only a student's official registration to state preschools but also their unofficial registration to grade one in a location where there was no preschool service. Consequently, it partially represented geographical difference and parental enthusiasm for their children's education, in addition to the actual measure of preschool experience itself. A thorough observation of the results from three cohorts revealed that students who experienced preschool were of higher advantages for their later schooling. That is, preschool experience did not bring about much effect in early grades of primary schools (1-3) but from grade 4 until the end of lower secondary school, its impact became so pronounced.

Late school entry gave students a very strong push out of school when they were in grades 1-3 (B=0.246). Once they go up to higher grades of schooling, its effect size became smaller and smaller, in comparison to other predictors. It finally became insignificant when students were in lower-secondary schools (B=0.121).

As regard to ethnicity, this study found that Cham children started to heavily drop out of school between grades 4 and 6. As explained in Study One, several reasons can explain this phenomenon. First, Cham people communicate with each other in their own language. Public schools are the only place to learn Khmer. That is why Cham children did not leave school in the first few grades of primary school. Once they can orally communicate in the official language, they start to depart from public schools to their religious schools.

Those who survive these stages and move onto lower secondary schools would even have a little bit lower dropout possibility than the Khmer students.

At academic affair factors, a number of predictors played roles in forcing students out of school even after achievement was controlled. First, grade retention increased high possibility of receiving less education even after achievement was controlled. Working in the same way as repetition, relative achievement within a class strongly affected dropout in cohort 2 and 3. Cambodian parents seemed to use the ranks provided by homeroom teachers as a baseline to balance a tradeoff between further schooling and early employment. Students who ranked high in class were found to have more advantages of schooling. Results from this study informed that parents started to value their children's ranks in class very strongly when their wards were in the later grades of primary school onwards.

Changes in frequency of homework completion and irregular attendance were harmful symptoms that schools and teachers could observe to identify risk students. In Cambodia, little attention has been paid to students' attendance by teachers, because of their low professional motivation to work for low pay and high student-class ratios. For example, during the three years of observation, researcher found that most teachers never recorded their students' attendances onto attendance books. Such an ignorance of its importance leads to less effective prevention measures on this educational problem. These two findings are good reminders for school administrators and teachers.

On psychological drive, it was claimed that good quality of student-student interaction inside school increased a higher chance of school retention in early grades of primary schools. For the first-graders, schools are new places for socialization after homes.

It is deemed necessary that schooling experience must be fun and enjoyable to attract them to school to be in school. Self-esteem on contrary turned significant when students reached higher grades (4-9). It is hard to explain this phenomenon. One possible explanation can be high self-esteem students tend to have much joy in schooling and have better academic achievement (Alves-Martins, Peizoto, Gouveia-Perira, Amaral & Pedro, 2002; Marsh, Byrne & Yeung, 1999).

All family level predictors lost their significance when a tight control had been made on each student-level parameter. Only in the first cohort, proportional hazard analysis recognized a strong negative effect of parental divorce on their children schooling. Within their own level, parental divorces jeopardized their children's schooling at early grades of primary schools. As students progressed to higher grades of primary schools and lower secondary schools, family practice variables, namely parental aspiration and academic support, became so pronounced. In the early grades, family members had high involvement in students' academic work and set higher aspiration for their schooling. Once they reached higher levels, the students whose parents and siblings were not so well-educated tended to receive less support from them. On this point, it is hard to say whether it was the support from families or presence of their elder siblings who were still inside schools that caused their lower dropout chances. It would be more meaning, if this study had included another variable on the elder siblings' influences. By large, it still can be concluded that the practices of setting high educational aspiration and getting involved in schooling progress from family encourage children to stay longer in schooling.

Its influence, in comparison with other variables in the same level, family wealth

was less influential in explaining dropout decision at primary school level. It became stronger when students were in lower secondary schools. This finding thus supported the policy by the Cambodian government that provided financial support to lower-secondary students, to some extent. Once the influences from individual student variables were kept constant, it became insignificant, though. Another important predictor that has been believed as the second main reason why children were in school, child labor, was not found to be important in this study at any single model of TCC or TVC methods. It is very confident that the amount of time that students reported to have spent helping their families was not significant. No matter how rich or poor their families were, most of them spent almost the same amount of time in their family businesses and household chores.

From this study, being in some specific schools or communities was found to be harmful for students' schooling. At primary school level, School 1 had the lowest dropout hazard risk. This school is located very near to the capital city, around 50 km meters away. It was founded by the community and its size was very small. Though there was no kindergarten service available, parents in this community unofficially enrolled their children in grade one when they were four or five years old. It can be tentatively concluded that high interest in schooling of the community, flexibility of school policy in facilitating learning process of students, small school size, and short distance from capital city positively increased the length of children's schooling. School 4 and 5, which are situated 35 and 81 kilometers from the town center respectively, had the lowest survival rates. These schools were large but very few official teachers were allocated to these schools. In School 5, there was only one official teacher. That is the principal himself. The principal was also teaching.

Remaining teaching staff was contract teachers. During three years of observation, those contract teachers moved in and out freely. No contract teachers permanently stayed for the whole three years. The condition in School 4 was of no difference. In the first year, there were only three official teachers, but in the second and third years, two officially appointed teachers remained. The rest of teachers were on contract. In year two, this school was run in 3 shifts, due to a large number of enrolled students but fewer teachers. School 2 and 3 are located near the main roads, which are not so far away from the town center. Their hazard levels were not much different. From explanation above, several hypotheses could be made on what could be the impacts from schools and communities. The distance of school location to town center or capital city did matter a lot. Remote schools received less attention, which resulted in high student-teacher ratios and poor level of education delivered by unqualified teachers. How communities valued and participated in school affairs was also a good point to look at when studying school dropout in Cambodia.

At lower-secondary level, conditions were not much different; except for there was no contract teacher, though differences in dropout rates were quite large.

5.4 Concluding Remarks

By using a completely different method from the previous studies in Cambodia, this study added much empirical understanding of school dropout nature in Cambodia. It discovered many important predictors that have been overlooked. It sought for trends of dropout from very low grades of schooling until the end of lower secondary level. Meanwhile, it had power to predict when each significant parameter would take an influence.

It is, hence, of great value for policy planning and implementing to help reduce dropout rates in rural Cambodia.

The four questions raised could be answered in the following short terms. First, the results from this study proved that causes of dropout did not remain the same from grade to grade, which made a single study that selected only a group of students meet many challenges to generalize its findings. Second, there were many reasons why children made school departures. Students who entered school late or had no preschool experiences, low achievement, low self-esteem, high level of absences and repetition, low frequency of completing homework, poor relationship with other students, and low ethnic status left school faster than did regular students. However, the ways those predictors generated their influential powers were not identical. Some determinants, such as late school entry, started their adverse impacts soon after students entered schooling, whereas some significant others, like repetition, preschool experience and relative achievement, started their influences at higher grades. Their connecting influential powers from one cohort to another were consistent in a pattern that allowed researchers, educators and policy makers to identify which groups of students or children can be classified as risk students. To answer research question 4, TVC and TCC models were constructed and put into analysis. Results from the models showed a number of time-varying covariates, such as students' absences, homework completion frequency, and self-esteem, did change their value greatly. These changes affected dropout possibility at large extent. Though it was not strong, higher increase in academic support from families were reported from the survivor students. In other words, dropouts received less support from their families before they finally drop out.

CHAPTER 6

DUPLICATION STUDY

PRIMARY SCHOOL DROP-OUT IN TWO RURAL CAMBODIAN PROVINCES

This study aimed at revealing causes of school dropout in Cambodian primary schools to clarify its influential factors and to gain deeper insights into its phenomenon, using the same method as the main study. The primary purpose of this research is to increase a broader generalization by including more sample students from a different province. Its findings from the two grade specific results will be cross-checked and later on the findings will be discussed in parallel with those of the main study.

6.1 Research Setting and Sample in Brief

Kampong Cham and Prey Veng provinces were purposively selected as the research areas since dropout rates were comparable to that of the whole country based on the Education Management Information System (EMIS) database of MoEYS in the academic year 2006-2007. Eleven primary schools, six of which were located in Prey Veng Provice, were chosen based on their dropout rates starting from the lowest to the highest rates. Within these sample schools, grades one and five were randomly selected to test the generalizability of the main research findings.

Five hundred and sixty two first-graders and 468 fifth-graders were selected by means of cluster random sampling, as listed in Table 6.1. In Kampong Cham, 282 students participated in the study at the beginning of school year but at the end of school year, 19 students were not longer inside school. In grade 5, the rate became a little big higher. Thirty

nine students out of the total sample of 253 made school departures. In Prey Veng Province, more grade-one students were reported to leave school early. After many of the risk children had left, the remaining tended to continue to stay in schooling. Data collection method and instruments were the same as what were used in the main study. It should be noted that the data collection process started in November, 2008 and ended in November, 2009.

Table 6.1. **Number of sample and dropout rates by schools**

	School	Grade 1		Grade 5	
		Sample	Dropouts	sample	Dropouts
Kampong Cham Province	Primary school 1	20	0	23	0
	Primary school 2	63	2	78	6
	Primary school 3	62	9	80	11
	Primary school 4	59	1	58	21
	Primary school 5	78	7	14	1
Sub total		282	19	253	39
Prey Veng Province	Primary school 1	85	11	15	1
	Primary school 2	50	16	63	5
	Primary school 3	20	4	28	1
	Primary school 4	29	0	23	2
	Primary school 5	37	15	63	9
	Primary school 6	59	10	23	3
Sub total		280	56	215	21
Total		562	75	468	60

6.2 Data Analysis

Given the dichotomous nature of the outcome variable, the data obtained from the fieldwork was analyzed by means of logistic regression using IBM SPSS Statistics 19. Principally, the *block forced entry* method was employed, for the researcher intended to investigate in a detail of the interaction between each predictor when it was put or taken out of the models.

6.3 Results and Discussions

Tables 6.2 and 6.3 highlight several significant predictors that positively or negatively influence the odds of dropout. There are common factors in both grades, such as academic achievement and family ethnic status, while the remaining significant predictors influence dropout predictability in either grade one or five.

6.3.1 Grade One

6.3.1.1 Individual Characteristics

There are two predictors that appeared to be significant in both provinces. Despite some variations in its effect size, late school entry was found to be so harmful for rural Cambodian children's schooling. In Kampong Cham, entering school one year late would increase the odds of drop-out y 1.887 times, but in Prey Veng the odds ratio was slightly lower, 1.667. Regression analysis also showed that children who maintained good relationship with others inside school had high possibility of school survival, in both provinces.

Meanwhile, academic achievement was found significant in Prey Veng, while it was statistically insignificant in Kampong Cham. It is very hard to explain why this phenomenon happened. However, if we look at the exponential values of B in Table 6.2, we can assume that academic achievement also influenced the drop-out decision in Kampong Cham but its influence was not strong enough to reach significance level. The results proved that one standard deviation increase of the students' test scores would result in a drop-out possibility deduction by .354 times in Prey Veng. Though insignificant, it would largely reduce drop-out possibility in Kampong Cham by .446 times. This phenomenon might be

because of a small sample size of dropout students in Kampong Cham (19 dropouts).

Table 6.2. **Drop-out estimates of the first-graders in Kampong Cham and Prey Veng**

	Kampong Cham			Prey Veng		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Constant	-10.358	3.611	.000	-.221	2.902	.802
Gender (Male)	1.029	.972	2.798	.649	.449	1.523
Preschool experience	-.835	1.495	.434	.056	.578	1.057
Age at first school entry	.634**	.236	1.886	.511*	.206	1.667
Commute distance	1.211	.655	3.358	.347	.393	1.707
Repetition	-.416	.485	.660	-.737	.527	.478
Achievement	-.808	.461	.446	-1.039***	.246	.354
Absences	-.137	.362	.872	-.306	.271	.758
Homework completion	-.407	.314	.666	.142	.189	1.152
Time helping family	-.098	.217	.907	.017	.156	1.017
Education aspiration	-.396	.398	.673	-.363	.368	.868
Self-esteem	.119	.267	1.126	1.176	.674	3.240
Relationship with others	-1.566**	.494	.209	-.870**	.335	.419
Relationship with teachers	.310	.356	1.364	-.582	.403	.559
Family economic status	-2.182	1.393	.113	-.007	.537	.993
Parents' education aspiration	.115	.430	1.122	.520	.413	1.595
Academic support from family	.212	.351	1.236	.609	.316	2.544
Parents' educational Attainment	-1.033*	.447	.356	-1.091***	.237	.336
Parentless						
Divorced parents	1.911**	.909	6.759	.657	.760	1.929
Presence of both parents	-1.000	1.344	.368			
Family size	.364	.295	1.439	.041	.144	1.042
SchoolID						
SchoolID(1)	-12.996	760.673	.000	-1.038	.737	.354
SchoolID(2)	1.919	1.411	6.816	1.407	.758	4.085
SchoolID(3)	1.351	1.176	3.861	-2.178*	1.052	.113
SchoolID(4)	.481	1.501	1.618	-12.992	613.191	.000
SchoolID(5)				2.105**	.808	8.204
Cox & Snell R Square		.221			.353	
Nagelkerke R Square		.568			.558	
-2 Log likelihood		68.733			158.258	

***Note**: * p<0.05, ** p<0.01, *** p<0.001*

Table 6.3. **Drop-out estimates of the fifth-graders in Kampong Cham and Prey Veng**

	Kampong Cham			Prey Veng		
	B	S.E.	Exp(B)	B	S.E.	Exp(B)
Constant	-7.917*	3.755	.000	.062	8.418	1.064
Gender (Male)	.481	.682	1.618	.896	1.756	2.055
Preschool experience	-2.597*	1.264	.075	-6.919*	2.958	.001
Age at first school entry	.831**	.311	2.295	2.103*	.926	8.190
Commute distance	.464	.376	1.591	-2.283	1.303	.102
Repetition	.926*	.401	2.524	2.064*	.928	7.879
Achievement	-1.005**	.317	.366	-2.708**	1.132	.067
Absences	.359	.308	1.433	-.213	.598	.808
Homework completion	.655	.519	1.925	.691	1.120	1.995
Time helping family	.149	.169	1.161	-.075	.291	.928
Education aspiration	-.065	.260	.937	-.579	.648	.561
Self-esteem	-2.043***	.558	.130	-2.275**	.945	.103
Relationship with others	-.399	.444	.671	-1.669	1.221	.188
Relationship with teachers	-.273	.428	.761	-.416	1.094	.659
Family economic status	-.048	.181	.953	-.241	.712	.786
Parents' education aspiration	-.035	.293	.966	-.130	.604	.878
Academic support from family	-.269	.345	.764	-.990	.933	1.634
Parents' educational Attainment	-.095	.283	.909	-1.466*	.743	.231
Parentless						
Divorced parents	1.136	.964	3.113	4.025	2.414	55.978
Presence of both parents	-2.053**	.934	.128	-3.668	2.894	.026
Family size	-.339	.185	.712	-.268	.350	.765
SchoolID						
SchoolID(1)	-14.297	6318.605	.000	1.366	2.725	3.921
SchoolID(2)	2.088	1.738	8.071	-6.216*	2.988	.002
SchoolID(3)	4.030*	1.777	56.270	-7.874*	3.933	.000
SchoolID(4)	4.603**	1.789	99.762	-2.879	2.185	.056
SchoolID(5)				-2.571	1.926	.076
Cox & Snell R Square	.366			.342		
Nagelkerke R Square	.634			.723		
-2 Log likelihood	102.310			47.683		

***Note**: * p<0.05, ** p<0.01, *** p<0.001*

6.3.1.2 Family Characteristics

Two predictors were found to explain the reasons why many rural Cambodian children were not in school. As expected, the education level of the parents greatly affected their children's schooling in both provinces. The statistics presented in Table 6.2 indicated that its influential level was not quite different (Exp B= .356 in Kampong Cham and Exp B= .336 in Prey Veng). However, in Kampong Cham, the divorce of the parents negatively affected their children's length of stay inside school. In Prey Veng, it was not significant. After observing the data on family structures in the two provinces, the research was confident that the difference in this finding was because in Kampong Cham, there were more variations of the family structures. As shown in Table 6.4, in Prey Veng Province, no single students reported that their parent(s) passed away. The percentage of the students who were residing in divorced families was also much lower than in Kampong Cham. If more students with divorced families had been included, it would become significant, due the fact that it held an existing large ratio of 1.929 (see Table 6.2).

Table 6.4. **Family structures of the sample students in both provinces**

	Kampong Cham		Prey Veng	
	Frequency	Percent	Frequency	Percent
Parent(s) passed away	18	6.4	0	0
Divorced families	32	11.3	20	7.1
Families with living parents	232	82.3	260	92.9
Total	282	100.0	280	100.0

6.3.1.3 School Factors

In Prey Veng Province, much difference between schools could be observed. Using School 6 as a baseline, the logistic regression proved that being School 5 put students at an eightfold higher risk of drop-out, while being in School 2 increased more chances of their further education. In Kampong Cham, there should be a difference better School 1 and other four schools; however, since School had 0% of the dropout rate, regression equation became erroneous.

6.3.2 Grade Five

6.3.2.1 Individual Characteristics

All the significant variables appeared in both provinces. First, late school entry continued to exert its adverse effect on children's schooling. When students proceeded up to this grade, their academic achievement turned to be a key indicator for their parents to balance the trade-off between their schooling and early employment. Third, preschool experience did not matter much when the students were in grade one, but when they reached higher grades of primary, it was so vital for their schooling lives. It could be assumed that preschool experience did not generate immediate effects but its effect was accumulating grade by grade. It is a long-term effect predictor of drop-out. The analysis also revealed that the more frequently the students repeated the grades, the higher possibility they possessed in dropout. In grade one, repetition did not have immense weight on drop-out decision, but if they kept repeating, their ages became much old for their grades, which made the opportunity cost of schooling become increasingly high. Finally, high self-esteem put the students at enormous advantage in long schooling. By and large, at this level, there was no

inconsistency in the significant variables found in both provinces.

6.3.2.2 Family Characteristics

Two predictors were found to be so significant at this level. However, parental education background remained explaining why children in Prey Veng made a school pathway. On contrary, in Kampong Cham, the results confirmed that if a child who stayed with their living parents had much higher school survival rates than the child whose parents passed away. Statistically, a child with deceased parent(s) had around 7.5 times dropout possibility higher than a child with both living parents. Figures 6.1 and 6.2 shows that in Prey Veng Province, the education levels of the parents were well distributed than in Kampong Cham. In Kampong Cham, most of the parents received some years of primary education or never attended at all. In Prey Veng Province, for instance, around 25% of the sample students' fathers received lower secondary education. The narrowly distributed patterns of the parent education background in Kampong Cham might have affected the regression models, which was why it became insignificant. With regards the family structure, in Prey Veng Province, very low rates of deceased and divorced parents were reported. About 92.4% of the sample students reported that their parents were living together in their villages at the time of the fieldwork.

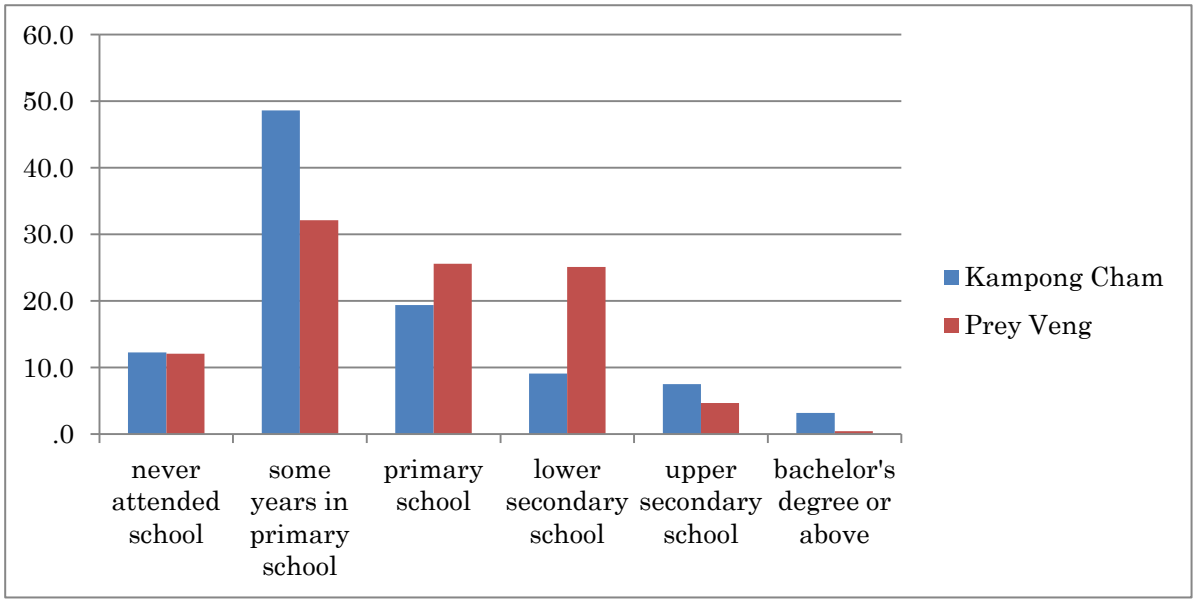


Figure 6.1. **Distribution of the father's education level in percent**

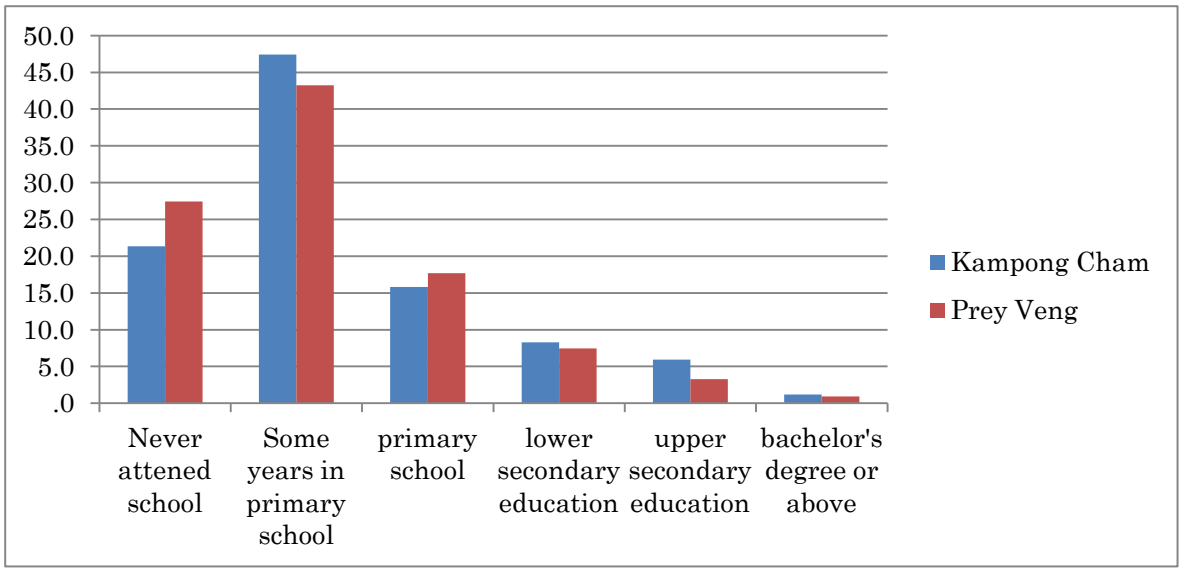


Figure 6.2. **Distribution of the mother's education level in percent**

6.3.2.3 School Factors

In this grade, the logistic regression models produced a very consistent result. As reported in Table 6.3, being some schools might put the students at advantages or

disadvantages of schooling.

In order to gain insights into what parts of school force students to leave school earlier, Bivariate correlation was employed. Results revealed that school dropout rates were strongly correlated with teachers' pedagogy (r = -0.73, p<0.01) and pupil-teacher ratio (r = 0.74, p<0.01).

It was found that, in most sample schools, the pupil-teacher ratio was actually higher than the standard set by MoEYS. Such a high ratio was mainly due to a shortage of teachers and classrooms in rural areas. This high teacher-pupil ratio increases the teachers' workload and thus lowers their teaching quality. In school 5 and 6 of Prey Veng Province, the teacher-pupil ratios were 152.8 and 136.7 respectively. All the teachers in those two schools were required to teach in both morning and afternoon shifts. The exhaustion from teaching in both shifts surely had a negative impact on their teaching performance, which in turn has a negative effect on student's learning experience and outcome, and finally puts the students at risk of dropping out of schools before completing the primary cycle.

The teachers' pedagogical experience was measured by how long teachers were trained before they started teaching. The result suggested that trained teachers tended to have better and more effective teaching methods and greatly improve their students' learning performance and experience, which contributed to a decrease in school dropout rate. The current finding lent more support to those of the earlier studies (e.g. Diyu, 2002; Levy, 1971; UNESCO, 1984).

6.3.3 The Most Cited but Insignificant Predictors

The most cited predictors on school dropout in Cambodia as well as other

developing countries as a whole – poverty, long school distance and child labor – were found insignificant in the current study. The school distance was shortened greatly, until recently, due to the one-village one-primary-school policy of the Cambodian government. This study, regrettably, failed to examine the relation between the types of work they performed and dropout. There might be no relation between the amount of time children spent helping their families and dropout, but some types of work they performed might be harmful for their schooling. In addition, since this study focused on the rural parts of Cambodia, it should be noted that geographical poverty may be visible in any comparative study among urban, rural and remote areas.

6.4 Concluding Remarks

From the aforementioned findings, it is worth noting that the nature of dropout in Cambodia varies from grade to grade, which makes any attempt to identify its uniform causes at a certain educational level, say primary school, by selecting the students from some grades quite unrealistic. Still, there are some common factors from each grade; however, as students proceed to higher grades, their characteristics, family conditions, and other factors also start to vary. This makes the influential variables in previous grades lose their significance, which results in new significant factors.

Though there were small differences of the findings, this study produced very consistent results in both provinces. The accuracy of findings seems to provide extra weight of generalizability of the findings in the main study if much similarity could be observed between the findings of this study and those of the main study.

CHAPTER 7

DISCUSSIONS

From a series of analyses using different methods, it could be concluded that it is ill-advised to only depend on the results of one specific method to comprehend dynamic process of dropout. A combination of the analysis results from multi-wave data and grade-specific data helps explain phenomenon more precisely. The comprehensive results from Cox Regression could describe an overall picture of dropout. To see at which grade the influence of a predictor started, grade-specific analysis results can have a power to respond to such a question. However, a grade-by-grade analysis also needs panel data that is segmented by grade.

The results from each cohort and grade analyses showed that though there were some consistencies of important predictors, but their levels of influences were not the same. Some predictors, for example late school entry, started to have a very strong negative impact on children's schooling at early grades but as they continued to attend higher grades, its influence turned substantially weaker. On the other hand, a few variables, such as preschool experiences, had weak impacts in reducing dropout likelihood at low grades. It pronounced louder voice when students were in lower secondary schools. Meanwhile, some variables had relationship with dropout at either lower or higher grades. Hence, it was clear evidence that causes of school dropout varied by grade. What forced young students to leave school were not the same as what pushed or pulled older students out of school.

7.1 Student Level Predictors

7.1.1 Background Characteristics

Girls tended to have slightly higher risks of dropout than boys. In the first study, at primary level, girls were found to make earlier school departure than boys but at lower secondary school level, its power was so weak. After controlling for other factors, gender is no longer significant. In-depth investigation was further conducted by including more sample students at primary school level. In the second study, it was extremely obvious that both primary school boys and girls had similar dropout possibilities. This result disputes what were stated by Keng (2003) and Valesco (2001). As described in Chapter 2, gender disparity in NER and GER at basic education level at present time is very narrow, so do their national rates of dropout. The insignificance of gender from this research is consistent with the recent nationwide trend.

Since preschool education has not been so popular in rural Cambodia, it received little empirical attention from dropout researchers, though there is excessive global evidence proved its positive relation with later school outcomes and dropout (e.g. Barnett, 1995; Reynold et al., 2007). The study results revealed that students who experienced preschool service were of higher advantages in their later schooling. That is, preschool experience did not bring about much effect in early grades of primary schools (1-3) but from grade 4 until the end of lower secondary school, its impact became so pronounced. *Preschool Experience* variable might have represented two other different characteristics. First, as explained in section 4.2.3.1.2.1, preschools are only available in some developed areas of the province where there is surplus of teachers. It thus represented a geographical location itself. Second,

some areas where preschools were not available, some motivated parents might have unofficially registered their children to grade one, since they were four or five years old. The students who experienced such a kind of unofficial enrollment to grade one were also counted as having received preschool service in this study. The later measure shows the ways that Cambodian parents value education for their children, partially. In other words, it could be said that students whose parents valued the importance of education or who lived in a location where preschool service was available had much lower dropout rates than did normal students.

Late school entry gave students a very strong push out of school when they were in grades 1-3 (B=0.246). Once they went up to higher grades, its effect size became smaller and smaller, in comparison to other predictors. The relation between school drop-out and the age of first school entry was proved by many previous studies in Cambodia (e.g. Valesco, 2001; World Bank, 2005). However, the result from the current study is more informative. Rather than providing the general statement of their relation, this study proved that late school entry had negative significant impact only when the students were in primary school. Once they reach lower secondary school, it was no longer significant when students were in lower-secondary schools (B=0.121).

As regard to ethnicity, this study found that Cham children started to heavily drop out of school between grades 4 and 6. As explained in Study One, several reasons could describe this phenomenon. First, Cham people communicate with each other in their own language. Public schools are the only place to learn Khmer. That is why; very few of them left school in the first few grades of primary school. Generally, families from minority

groups whose parents devalue the importance of education did not enroll their wards at all (Bredenberg, 2008; UNESCO, 2007). Once they could orally communicate in the official language, they started to depart from public schools to their religious schools. Those who could pass this period and move onto lower secondary schools would even have a little bit lower dropout possibility than did the Khmer students.

7.1.2 Academic Performance and Behaviors

Grade retention increased higher odds of dropout. A large body of literature has proved their relationship so far but very few studies looked at grade-specific risks. In Cambodia, Keng (2003) also stated that repletion caused high dropout rates of rural Cambodian girls, but her method did not allow her to firmly assure which grades or level her finding should be applied to. The current finding informed a long-term detrimental power of repetition. When students remained young, a few times of repetition did not matter much. However, this prior educational failure started to produce a strong effect when the students proceeded to the higher grades. Those grade repeaters turned to be older than their classmates. That made them feel ashamed of their cognitive development and they face difficulties socializing themselves with their young classmate. Furthermore, as their ages increase, so do their opportunity costs of schooling. These forced them to leave school early.

Most of the teachers in the sample schools were not happy with the provincial standards that forced schools to pass some percentage of students, regardless of what their teachers assessed their academic performance. Usually, in Cambodia the education stakeholders believe that repetition is a good preparation for slow learners to master required curriculum. However, Darling-Hammond and Falk (1997) assert that repetition does not

work in educational policies, because (1) it does not comply with the continuous development of a child; (2) norm-referenced tests are to rank students, not to measure their levels of mastery; (3) it is a haphazard to put a decision to fail students in hands of teachers; and (4) grade repetition results from many school factors, rather than pupils themselves. It should be noted that repetition in Cambodian public schools is a consequence of poor performance and heavy absenteeism. According to the article 23 of the internal regulation for public secondary schools dated on February 26, 1998, students shall repeat the grade if they have been absent more than 30 times.

It also found that Cambodian parents seemed to use the ranks provided by homeroom teachers as a baseline to balance a tradeoff between further investment in their children's schooling and early employment. Students who ranked high in class were found to persist longer in schooling. In Cambodia, no empirical evidence on relationship between achievement and dropout was ever mentioned before. Results from this study informed that parents started to value their children's ranks in class very strongly since their wards were at primary school, as proved by the second study. It alerts policy makers and educators, who generally believe that ranking places students in academic competition and raises the quality of education; however, relative ranking produces more harms than its benefits.

Changes in frequency of assigned homework and irregular attendance were harmful symptoms that schools and teachers could observe to identify risk students. In Cambodia, little attention has been paid to students' attendance by teachers, because of their low professional motivation to work for low pay and high student-class ratios. For example, during the three years of observation, the researcher found that most teachers never recorded

their students' attendances onto the student attendance books. Such an ignorance of its importance leads to less effective prevention measures on this educational problem. These two findings are good reminders for school administrators and teachers.

7.1.3 Psychological Characteristics

On psychological drive, it was claimed that good quality of student-student interaction inside school increased a higher chance of school retention in early grades of primary schools. For the first-graders, schools are new places for socialization after homes. It is deemed necessary that schooling experience must be fun and enjoyable to attract them to school. Self-esteem, on contrary, turned significant since students started grade one and it continued to have control over their educational pathways until the last grades of lower secondary schools (4-9). They were unique contribution for dropout literature in Cambodia where scholars usually neglected the importance of psychological predictors. Like what were going with low frequency of homework completion and high absenteeism, these two determinants can be used by schools to identify risk students.

7.2 Family Level Predictors

All family level predictors lost their significance when a tight control had been made on each student-level parameter. There only two important characteristics of a family that were found to have positive relation with dropout possibility. The children whose parents were divorced or passed away were at higher risks of ending their educational careers earlier. Their effects were detrimental when students were at primary level. Low parents' education backgrounds strongly raised dropout odds in the first few grades of primary school, but played less role at lower secondary level. From descriptive statistics,

majority of parents in rural areas attended primary schools but few of them could complete. Their average education levels became higher and higher as students moved along grades. For example mean of the cohort one father's education[7] was 1.24, while they were 1.65 and 1.83 for cohort 2 and 3 respectively. This pattern was suggestive in a way that students with low parental education left first and those with high parental education background left school latest.

There were some variables that might influential parameters of school dropout. Because of small sample size, it could not be clearly guaranteed that they did not play any roles in dropout. As a principle, survival analysis needs larger sample than other kinds of multivariate analysis tools. Eliason (1993) recommended a sample of at least 60 if five or less covariates were introduced to survival models. As students progressed to higher grades of primary schools and lower secondary schools, family practice variables, namely parental aspiration and academic support, became so pronounced. In the early grades, family members had high involvement in students' academic work and set higher aspiration for their schooling. Once they reached higher levels, the students whose parents and siblings were not so well-educated tended to receive less support from them. On this point, it is hard to say whether it was the support from families or presence of their elder siblings who were still inside schools that caused their lower dropout chances. It would be more meaning, if this study had included another variable on the elder siblings' influences. By large, it still can be concluded that the practices of setting high educational aspiration and getting involved in

[7] Father or mother's education attainment was coded from 0 to 5. 0 was for never attended schooling; 1 for attended for some years but could not complete primary schools, 2 for stopped after completing primary schools, 3 for lower secondary schools, 4 for upper secondary schools, 5 for bachelor's degree or higher

schooling progress from family encourage children to stay longer in schooling.

7.3 School Level Predictors

From this study, being in some particular schools or communities was found to reduce for students' schooling time. Being in a community where people are interested in education by helping school raise fund or showing strong support of school activities put students at an advantage of long schooling. Meanwhile if students attended a school located far away from town center, they were more likely to drop out. Remote schools received less attention, which resulted in high student-teacher ratios and poor level of education delivered by unqualified teachers. In the first study when more schools were included, Bivariate correlation analysis was performed to tentatively see what were assumed previously true. Analysis revealed similar finding. School dropout rates were strongly correlated with teachers' pedagogy (r = -.73, p<.01) and pupil-teacher ratio (r = .74, p<.01). It was found that, in most sample schools, the pupil-teacher ratio was actually higher than the standard set by MoEYS, 45 students per teacher. Two of the sample schools had teacher-pupil ratios of 152.8 and 136.7 respectively. This indicated the imbalance of public funding and teaching staff deployment between the developed and less developed areas within a province. New teachers are usually deployed to far-flung areas when they start their first careers. It is very common that most of them stay for one or two years then they asked for location transferring. Finally, only contract teachers and less trained teachers work in those areas.

7.4 Some Important Determinants in Previous Studies

The most cited predictors on school dropout in Cambodia as well as other developing countries as a whole – child labor and school distance – were found insignificant

in the current study. Through an extensive number of analyses by using reduced models or other kinds of models, the amount of time students used to help their families and the school distance they commuted back and forth were proved no significant at any grade. With respect to school distance, many studies on dropout in Cambodia (e.g. MoEYS, 2000; Valesco, 2001) showed similar results of its adverse impact on children's schooling. Due to the policies implemented by the government in the mid 2000s, many primary and lower secondary schools were built on a nation scale. That considerably shortened the commute distance in most rural areas. That might explain why it turned to be insignificant now. It was almost certain that the amount of time students needed to help their families, for most of students reported to help perform some household work or family businesses. This study, regrettably, failed to examine the relation between the types of work they performed and dropout. The time might not matter but the types of work that jeopardize.

It is commonly believed that poverty is the most important contributing factor to terminating schools (MoEYS, 2000; Valesco, 2001; World Bank, 2005). In a World Bank report, poverty had played a role as a background variable to the significant predictors, such as late school entry, child labor, and so forth, though it did not directly influence the dropout. Thus, interaction variables between family economic status and late school entry, and family economic status and child labor were built to include in reduced models, but no significant impact of these two predictors were detected at primary school level. Once they were in lower secondary, the costs of schooling became radically different. Bray and Bunly (2005) estimated that direct cost difference primary and lower secondary schools was almost triple. Plus, opportunity cost was so high since they had more choices of work when they were 12

years or older (UNDP, 2000). That was why; its influence became stronger at this level. However, family wealth condition became stronger when students were in lower secondary schools. Once the influences from individual student variables were kept constant, it became insignificant, though.

CHAPTER 8

CONCLUSION

More than detecting what made students drop out, the application of event history models to the current study of student departure was a very information-enriched way to clearly observe when students made school departures and how parameters evolved themselves from lower to higher grades of schooling. Superior to the normal static models where variables are often thought to be time-invariant, this method permitted researcher to control for factors that were unmeasured or unobserved, that even made the results more robust. The estimation of competing events improved a better understanding of the complex interdependencies between events that are typically modeled independently.

More special than most studies using this method, this study used data pooled personally for purposes of dropout itself. Instruments used to pool data were framed through extensive reviews of the existing literature with some considerable adaptations to fit the contextual setting. Most of existing studies using the same method, however, used data pooled from some specific groups of sample that were prepared for other purposes rather than dropout. Usually such data did not permit them to include most of the important predictors in the analysis models. Since most of the data used in their studies were collected for household survey purposes, most of previous studies using this method limited themselves to the family-level parameters. For those which used data from youth survey, they could only touch on individual parts.

In Cambodia, it is the first attempt to longitudinally study school dropout as a

process, rather than an event. It expanded empirical understanding of this problem by providing new evidence to an existing literature of the country. Further, it added much better understanding of this phenomenon by time. That is, results from this study could inform educators and policy makers of what stages each predictor starts its impact.

8.1 Summary of Findings

From a series of analyses, a handful of important dropout determinants could be detected from three cohorts. Results themselves lent more support to the globally existing literature. Differentials were that the current study could predict at which phases of schooling those predictors started to have strong impacts. Such kinds of pattern investigation could be found in a few studies of the field (e.g. DesJardins, Ahlburg & McCall, 1999). In developing countries where panel data are scarce, only two-wave prospective data were available for analyses; for this reason, results from this study provided some sound suggestions on natures of school dropout where contextual settings are not quite different from Cambodia. In Cambodia where no single longitudinal study ever conducted, it provided very insightful and practical findings that the policy makers can utilize to form preventive policies to heal the dropout problem.

Student background characteristics had much influence when students were in primary school. It was found that if students entered school at older ages, they made earlier school departures. Its effect size was so enormous when students were at lower grades (1-3), but as students moved to higher grades of primary school (4-6), it turned weakly significant. Finally it had so weak and insignificant impact when they were in lower secondary school. Cham students started to leave school at an alarming rate when they were in higher grades of

primary schools. Their leaving period was short but the rates were high. Once they could enroll in lower secondary schools, their hazard rates became even lower than those of majority groups. Preschool experience was positively associated with later academic outcomes of students. Its positive relationship started since students stayed in lower grades, but it became strong and marked when they proceeded to higher and higher grades of schooling.

With regard to the predictors on academic and behavioral domains, this study could detect some insightful findings that provide firm evidence for dropout literature in Cambodia. A few times of repetition did not matter much when students were in lower grades, for they still looked young. These grade retention experiences put students at a very high risk of school termination when they reached higher grades. Repetition and relative achievement patterns of influence were very similar. High number of absences and low frequency of homework completion were signs where school administrators and teachers could use to identify risk students. This study could observe that before students finally dropped out, they started to have irregular attendances and completed fewer and fewer assigned homework. Though these symptoms are quite logical, no empirical evidence has been mentioned on this matter in Cambodia. It was also found that good quality of relationship with other students increased survival rates of the first-cohort students while high self-esteem significantly lowered dropout rates of the second and third cohort students.

At family level, the two studies suggested that primary school students whose parents were divorced or passed away tended to end their educational careers very fast. Parental education attainment might have some significant but weak influences on their

children's schooling once they were in primary schools; however, it is very certain that their influences disappeared in lower secondary schools. Compared to other predictors in this level, parental aspiration and family academic support tended to play some roles in dropout events. Usually the families who were involved in their children's schooling and set high aspiration level for their children were likely to keep their children in schools longer, regardless of their wealth conditions or their heads' educational levels.

A series of detailed analyses proved that some important predictors of school dropout in Cambodia as well as in developing countries were not significant. In both TVC and TCC models and grade-by-grade analyses, commute distance to school and amount of time students spent help their families were confirmed to have no significant impacts on children dropout. Because of the government's policies 'one village one primary' and 'one commune one lower secondary school', there have seen mushrooming increases of school buildings throughout the country. That might shorten commute distances in most rural communities. It was also found that most Cambodian students helped their family in the forms of household work and business, in accordance to their ages. Older students spent more time than their younger counterparts, independent of their family wealth situations and structures. Family economic status had no room in dropout event at primary school level. Its influence became stronger in lower secondary level but once influences from student-level parameters were also counted, it became insignificant.

Being in some specific schools or communities could put students at higher survival or hazard rates, according to the results from Cox Regression and Kaplan Meier analyses. Unfortunately, due to small sample size of schools, further analyses could not be

performed to dig out which parts of school that mattered. From a qualitative analysis, it was found that the schools that were located far away from the town center or main roads received less attention. As a result, they were in shortages of teachers and classrooms. They commonly had high pupil-teacher ratios and high absenteeism of teachers. These problems might interfere the students' learning and finally put them at risk of drop-out. On community side, when the remote areas had very low public and private employment rates, the students and their families lacked role models. That resulted in perceived insignificant value of education. High dropout rates were inevitable in those remote places.

This research also continued to examine whether the findings could be applied to other rural settings. By including another province to compare and contrast the findings, it was assured that the nature of school drop-out was not quite different. The difference was that parental divorce was found to have negative influence on their children's schooling in Kampong Cham while its effect was so small in Prey Veng Province. Meanwhile, parental education levels decreased the possibility of drop-out for the children in Prey Veng. The difference was due to the fact that little variation could be observed in the province where the variables became insignificant. Besides these differences, most of the findings were very consistent. Child labor and family economic status remained insigficant in the two sample areas. Hence, the findings from the main study, to a large extent, are applicable to other rural settings.

8.2 Limitations and Suggestions for Future Studies

This study set a good ground for any longitudinal study being attempted to carry out in Cambodia. Though it is of high value, the readers should be aware of a few limitations

of it. For those who wish to conduct a similar study, ways of dealing with those limitations are elaborated in full details here.

First, the sample size for each cohort was still small. Because of a small sample size, grade-by-grade analyses in this study could be performed with some generalizability constraints. By enlarging the number of sample, researchers can confidently assure the findings. Like phenomenon in family wealth, it was significant in some models of analysis but not in the others. It was very hard to precisely state its influence in lower secondary levels, though at primary school level the results were almost certain. With more sample, it will also make explanation of some incidents more informative and detailed. If this study had more sample from Cham minority group, more analyses would have been conducted by stratifying the whole sample by ethnic status. Then the clear reasons why those Cham children stopped schooling in cohort 2 would be discovered independently.

Second, the current study could only ascertain that communities where students lived and schools where they attended could be harmful or helpful for their schooling progression. With only five schools and communities from each cohort, it was unrealistic to include some predictors from these levels into analysis models. More geographical variations of communities will also increase levels of generalization of findings. With more schools and communities, multi-level survival analysis would be a better option to analyze the impacts of each variable within their own nested level. This analytical tool has been employed in recent studies of dropout in higher education and it is proved to be more accurate than the normal regression.

Observation intervals of this study were calculated in year, since the research

traced sample students on yearly base. Intervals should be more frequent by breaking them into smaller unit, say month or trimester. It would help specify and differentiate accurate event time. Also, observation duration should be longer. In this research, it could only be carried out for three years due to the high fieldwork cost and time constraints of his academic career. These did not permit researcher to visit research sites more frequently. More frequent observations and longer duration of observation would improve analysis models and understanding of phenomenon itself, as well as improvement in time-varying covariates.

Lastly, standard tests should be developed to compare and contrast the results obtained from relative achievement scores by homeroom teachers. First the scores from standard tests can be used to measure the actual achievement levels. Second, standardized scores from each class can be computed to cross-check the scores obtained from the classroom teachers. To know whether absolute or relative achievement affect dropout would help clarify means to reduce dropout rates. If absolute achievement matters, improving quality of education would be an effective way. On the other hand, if relative achievement matters more, a tradition of ranking students in class should be reconsidered.

Though there are a few limitations, this research is of some unique contribution to dropout understanding. It built up more literature of school dropout in Cambodia by finding out some important predictors that have been overlooked. It also helped improve levels of dropout understanding by looking at its dynamic nature longitudinally. Finally, a combination of grade-by-grade and cohort analyses proved to be an insightful way of scrutinizing this educational problem.

REFERENCES

Abrams, L., & Haney, W. (2004). Accountability and the grade 9 to 10 transition: The impact on attrition and retention rates. In G. Orfield (Ed.), *Dropouts in America: Confronting the graduation rate crisis* (pp. 181–205). Cambridge, MA: Harvard Education Press.

Akhtar, S. (1996). Do girls have a higher school drop-out rate than boys? A hazard rate analysis of evidence from a third world city. *Urban Studies*, 33(1), 49-62.

Allensworth, M. E. (2004). *Ending social promotion in Chicago: The effects of ending social promotion in the eighth grade on dropout rate.* Chicago: Consortium on Chicago School Research.

Allison, P. D. (1984). *Event history analysis: Regression for longitudinal event data* (Sage University Paper Series on Quantitative Applications in the Social Sciences, Series No. 05-046). Beverly Hills: Sage.

Alves-Martins, M., Peixoto, F., Gouveia-Pereira, M., Amaral, V., & Pedro, I. (2002). Self-esteem and academic achievement among adolescents. *Educational Psychology,* 22(1), 51-62.

Andre, P. (2008). *The effect of grade repetition on school dropout: An identification based on the differences between teachers*. Retrieved August 12, 2009, from http://pagesperso-orange.fr/pierre.andre01/zdocuments/repetition_senegal_2008_01_23.pdf

Asian Development Bank [ADB]. (2001). *Health and education needs of ethnic minorities in the greater Mekong sub-region.* Manila: Author.

Astone, M.N., & Upchurch, M.D. (1994). Forming a family, leaving school early, and earning a GED: A racial and cohort comparison. *Journal of Marriage and Family*, 56(3), 759-771.

Astone, N. M., & McClanahan, S. S. (1991). Family structure, parental practices, and high school completion. *American Sociological Review*, 56(3), 309-320.

Barnett, W.S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. *The Future of Children*, 5(3), 25-50.

Barton, C., & Rith, S. (2006, August 10). Corruption and poverty get school dropout blame. *The Phnom Penh Post*, pp. A1, A8.

Bedi, S. A., & Marshal, H. J. (2002) Primary school Attendance in Honduras. *Journal of*

Development Economics, 69, 129-153.

Behrman, R. J., Deolalikar, P., Tinakor, P., & Chandoevwit, W. (2000). *The effect of the Thai economic crisis and of Thai labor market policies on labor market outcomes.* Bangkok: Thailand Development Research Institution.

Belfield, R.C., & Levin, M.H. (2007). *The price we pay: Economic and social consequences of inadequate education*. Washington, DC: Brookings Institution Press.

Benveniste, L., Marshall, J., & Araujo, M. C. (June 2008). *Teaching in Cambodia* (Report No. 44850). Retrieved May 23, 2012, from http://ddp-ext.worldbank.org/EdStats/KHMwp08.pdf

Bernard, A. (2005). *Evaluation of UNICEF's child-friendly school project in Cambodia.* Phnom Penh: UNICEF/Sida.

Bickel, R., & Papagiannis, G. (1988). Post-high school prospects and district-level dropout rates. *Youth and Society*, 20(1), 123-147.

Bowers, J.A. (2010). Grade and graduation: A longitudinal risk perspective to identify student dropouts. *The Journal of Education Research*, 103, 191-207.

Bray, M., & Bunly, S. (2005). *Balancing the books: household financing of basic education in Cambodia* (Issue Brief No.2005-2). Washington, DC: World Bank.

Bredenberg, K. (2004). *Cambodia secondary education study: Educational demand in the basic education sector and strategies for enhancement.* Phnom Penh: World Bank.

Bredenberg, K. (2008). *Poor governance issues within the formal education sector in Cambodia*. Discussion Paper for USAID. Phnom Penh: KAPE.

Bridgeland, M. J., Dilulio, J. J. J., & Morison B. K. (2006). *The silent epidemic: Perspectives of high school dropouts.* Retrieved April 23, 2008, from Civic Enterprises web site http://www.civicenterprises.net/pdfs/thesilentepidemic3-06.pdf

Cambodian Ministry of Education, Youth and Sport. (1998). *Education Statistics & Indicators 1997/1998*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (1999). *Education Statistics & Indicators 1998/1999*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2000). *Education Statistics & Indicators 1999/2000*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2001). *Education Statistics & Indicators 2000/2001*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2002). *Education Statistics &*

Indicators 2001/2002. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2003). *Education Statistics & Indicators 2002/2003*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2004). *Education Statistics & Indicators 2003/2004*. (Final Draft). Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2005). *Education Statistics & Indicators 2004/2005*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2006). *Education Statistics & Indicators 2005/2006*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2007). *Education Statistics & Indicators 2006/2007*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2008). *Education Statistics & Indicators 2007/2008*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2009). *Education Statistics & Indicators 2008/2009*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2010). *Education Statistics & Indicators 2009/2010*. Phnom Penh: MoEYS Printing Office.

Cambodian Ministry of Education, Youth and Sport. (2011). *Education Statistics & Indicators 2010/2011*. (Final Draft). Phnom Penh: MoEYS Printing Office.

Cardoso, R. A., & Verner, D. (2006, December). *School drop-out and push-out factors in Brazil: The role of early parenthood, child labor, and poverty* (Issue Brief N. 2515). Bonn: Institute for the Study of Labor.

Chatterji, P., & DeSimone, J. (2005, May). *Adolescent drinking and high school dropout* (Issue Brief No. 11337). Cambridge: National Bureau of Economic Research.

Chaudhury, N., Hammer, J., Kremer, M., Mularidharan, K., & Rogers, H. (2004, June). *Roll call: Teacher absence in Bangladesh*. Retrieved from World Bank website: http://siteresources.worldbank.org/INTSOUTHASIA/Resources/Roll_Call_Teacher_Absence_Bangladesh.pdf

Chavez, L.E., & Oetting, R.E. (1994). Dropout and delinquency: Mexican-American and Caucasian non-Hispanic youth. *Journal of Clinical Child Psychology*, 23(1), 47-55.

Chen, R. (in press). Institutional characteristics and college student dropout risks: A multilevel event history analysis. *Research in Higher Education*.

Chen, R., & DesJardins, L.S. (2008). Exploring the effects of financial aid on the gap in

student dropout risks by income level. *Research in Higher Education*, 49, 1-18.

Chernichovsky D. (1985). Socioeconomic and demographic aspects of school enrollment and attendance in rural Botswana. *Economic Development and Cultural Change,* 33(2), 319-333.

Clayton, T. (1995). Restriction or resistance? French colonial educational development in Cambodia. *Education Policy Analysis Archives 3* Academic Search Premier. Ebsco Host. Defi ance College Pilgrim Library, Defi ance, Ohio.

Collins, M. J. (2009). Reconstructing access in the Cambodian education system. In D. B. Holsinger & W.J. Jacob (Eds.), *Inequality in education: comparative and international perspectives* (pp. 190-214). Hong Kong: Comparative Education Research Center.

Cothran, D., & Ennis, C. (2000). Building bridges to student engagement: Communication respect and care for students in urban high schools. J*ournal of Research and Development in Education*, 33, (2), 106-117.

Cox, D. R. (1972). Regression models and life-tables. *Journal of the Royal Statistical Society, 34*, 187-220.

Crowder, K., & Teachman, J. (2004). Do residential conditions explain the relationship between living arrangements and adolescent behavior? *Journal of Marriage and Family*, 66, 721-738.

Dadloe, C., Flanagan, J., Gore, R., Hozumi, K., Imhof, K., & So, P. (February 2007). *Universal primary education: Reaching the unreached in Cambodia.* New York: UNICEF.

Darling-Hammond, L. & Falk, B. (1997). Using standards and assessments to support student learning. *Phi Delta Kappan*, 79(3), 190-201.

DesJardins, L.S. (2003). Event history methods: Conceptual issues and application to student departure from college. In J.C. Smart (Eds.), *Higher education: Handbook of theory and research* (Vol. XVIII, pp. 421-471). Boston: Kluwer Academic Publishers.

DesJardins, L.S., Ahlburg, A.D., & McCall, P.B. (1999). An event history model of student departure. *Economics of Education Review*, 18, 375-390.

Diyu, X. (2002). Investigation and discussion on the problem of primary and secondary schools dropouts in poor areas. *Chinese Education and Society, 33*(5), 49-58.

Dorn, S. *Creating dropout: An institutional and social history of school failure.* Westport: Praeger Publishers.

Duggan, J. S. (1996). Education, teacher training and prospects for economic recovery in

Cambodia. *Comparative Education*, 32(3), 361-375.

Dy, S. S. (2004). Strategies and policies for basic education in Cambodia: historical perspectives. *International Education Journal*, 5(1), 90-97.

Eliason, S.R. (1993). *Maximum likelihood estimation: Logic and practice.* Newbury Prak, CA: Sage Publications.

Escott, J. (2000). Minority education in Cambodia: The case of Khmer Loeu. *Intercultural Education*, 11(3), 239-251.

Evan, N. W., Oates, E. W., & Schwab, M. R. (1992). Measuring peer group effects: A study of teenage behavior. *Journal of Political Economy,* 100(5), 966-900.

Farahati, F., Marcotte, D. E., & Wilcox-Gok, V. (2003). The effects of parents' psychiatric disorders on children's high school dropout. *Economics of Education Review*, 22(2), 167-178.

Finn, M. *Framing dropouts: Notes on the politics of an urban public high school.* New York: State University of New York Press.

Forste, R., & Tienda, M. (1992). Race and ethnic variation in the schooling consequences of female adolescent sexual activity. *Social Science Quarterly*, 73(1), 12-29.

Frase, M.J. (1989). *Dropout rates in the United States: 1988*. Washington, DC: National Center for Education Statistics.

French, C. D. & Conrad, J. (2001). School dropout as predicted by peer rejection and antisocial behavior. *Journal of Research on Adolescence*, 11(3), 225-244.

General Accounting Office [GOA]. (1986). *School dropout: The extent and nature of the problem.* Washington, DC: U.S. Government Printing Office.

Grissom, B. J. & Shepard, A. L. (1989). Repeating and Dropping Out of School. In L. A. Shepard and J. Smith (Eds), *Flunking grade: Research and Policies on Retention.* London: Falmer Press.

Hammer, B. (2003). ETS identifies factors affecting student achievement – Washington update. *Black Issues in Higher Education.* Retrieved July 25, 2011 from http://findarticles.com/p/articles/mi_m0DXK/is_22_20/ai_112166846/

Hanushek, A. E. (2008). Do students care about school quality? Determinants of dropout behavior in developing countries. *Journal of Human Capital*, 1(2), 69-105.

Hanushek, A. E., & Lavy, V. (1994). *School quality, achievement bias, and dropout behavior in Egupt* (Issue Brief No. 107). Washington, DC: The World Bank.

Hanushek, A.E., Lavy, V., & Hitomi, K. (2006, December). *Do students care about school*

quality? Determinants of dropout behavior in developing countries (Working Paper 12737). Retrieved from National Bureau of Economic Research website: http://www.nber.org/papers/w12737.pdf?new_window=1

Hidi, S., & Harackiewicz, J. M. (2000). Motivating the academically unmotivated: A critical issue for the 21st century. *Review of Educational Research,* 70(2), 151-179.

Hoa, L., & Cherlin, J.A. (2004). Welfare reform and teenage pregnancy, childbirth, and school dropout. *Journal of Marriage and Family,* 66, 179-194.

Holmes, J. (2003). Measuring the determinants of school completion in Pakistan: Analysis of censoring and selection bias. *Economics of Education Review,* 22(3), 249-261.

Hunt, F. (2008). *Dropping out from school: A cross country review of literature* (Research Monograph No. 16). East Sussex, England: University of Sussex, Center for international education.

Jimerson, S. R., Pletcher, S.M.W., Graydon, K., Schnurr, B. L., Nickerson, A. B., & Kundert, D. K. (2005). Beyond grade retention and social promotion: Promoting the social and academic competence of students. *Psychology in the Schools*, *43*, 85–97.

Johnston, J. (1984). *Econometric methods.* New York: McGraw-Hill.

Keng, C. S. (2003). Why do girls drop out of primary schools? An evidence from rural Cambodia. *Journal of Cambodian Studies,* 1(1), 3-15.

Keng, C. (2009). Basic education in Cambodia. In Y. Hirosato & Y. Kitamura (Eds.), *The political economy of educational reforms and capacity development in Southeast Asia: Cases of Cambodia, Laos and Vietnam,* (pp. 131-152). Tokyo, Japan: Springer.

Kiernan, B. (1985). *How Pol Pot came to power: Colonialism, nationalism, and communism in* Cambodia, *1930-1975.* Yale University Press.

King, M. E., Orazem, F. P., & Paterno, M. E. (2008, September). *Promotion with and without learning: Effects on student enrollment and dropout behavior* (Issue Brief No. 4722). Washington, DC: The World Bank.

Kominski, R. (1990). Estimating the national high school dropout rate. *Demography,* 27, 303-320.

Laird, J., DeBell, M., Kienzl, G., and Chapman, C. (2007). *Dropout Rates in the United States: 2005* (NCES 2007-059). U.S. Department of Education. Washington, DC: National Center for Education Statistics. Retrieved April 20, 2012 from http://nces.ed.gov/pubsearch.

Lavy, V. (1996). School supply constraints and children's educational outcomes in rural

Ghana. *Journal of Development Economics*, 51(2), 291-314.

Lehr, A. C., Clapper, T. A., & Thurlow, L. M. (2005). *Graduation for all: A practical guide to decreasing school dropout.* California: Corwin Press.

Levy, M. B. (1971). Determinants of primary school dropout in developing countries. *Comparative Education Review, 15*, 44-58.

Lloyd, B. C., Mensch, S. B., & Clark, H. W. (2000). The effects of primary school quality on school dropout among Kenyan girls and boys. *Comparative Education Review*, 44(2), 113-147.

Lloyd, B. C., Mete, C., & Grant, J. M. (2006). *The implication of changing educational and family circumstances for children's grade progression in rural Pakistan: 1997-2004* (Issue Brief No. 209). New York: The Population Council, Inc.

Lloyd, B. C., Mete, C., & Sathar, A. Z. (2005). The effect of gender differences in primary school access, type, and quality on the decision to enroll in rural Pakistan. *Economic Development and Cultural Change*, 23(3), 685-710.

Lloyd, B. C., Tawila, E. S., Clark. H. W., & Mensch, S. B. (2003). The impact of education quality on school exit in Egypt. *Comparative Education Review*, 47(4), 444-466.

Lott, L.J., Gardner, S., & Powers, A.D. (2009). Doctoral student attrition in the STEM fields: An exploratory event history analysis. *Journal of College Student Retention*, 11(2), 247-266.

Maani, S., & Kalb, G. (2005). *Academic performance, parental income and choice to leave school at age sixteen.* Auckland: The University of Auckland.

Mann, D. (1989). Effective Schools as a dropout prevention strategy. NASSP Bulletin, 73(518), 77-83.

Mansory, A. (2007). *Dropout study in basic education level of schools in Afghanistan*. Kabul: Swedish Committee for Afghanistan.

Mensch, S.B., & Kandel, B.D. (1988). Dropping out of high school and drug involvement. *Sociology of Education*, 61(2), 95-113.

Mike, O. I., Nakajjo, A., & Isoke, D. (2008). *Socioeconomic determinants of primary school dropout: The logistic model analysis*. Munich: (Munich Personal RePEc Archive Rep. No. 7851).

Morrow, G. (1987). Standardizing practice in the analysis of school dropouts. *Teacher College Record*, 87(3), 342-354.

National Committee for Sub-National Democratic Development [NCDD]. (Octobor, 2009).

Kampong Cham data book 2009. Retrieved February 03, 2012, from http://www.ncdd.gov.kh/images/stories/ncdd/2010/pdb/eng/ProvDataBook_E_3_2008.pdf

National Institute of Statistics. (August, 2009). *General population census of Cambodia 2008.* Phnom Penh: Author.

Natriello, G. (2002). *Dropouts, school leavers, and truancy*. In the Encyclopedia of International Education (Vol. 3, pp. 1602-1607). Oxford: BPC Wheatons Ltd.

Nicaise, I., Tonguthai, P., & Fripont, I. (2000). *School dropout in Thailand: Causes and remedies.* Flanders, Belguim: Katholieke Universiteit Leuven.

No, F. (2009). *An insight into the rural Cambodian dropouts at basic-education level: Causes and remedies* (Unpublished master's thesis). Hiroshima University, Hiroshima.

Open University Institute [OUI]. (2007). *Monitoring school dropout.* New York: Author.

Organization for Economic Cooperation and Development. (2002). *Education at a glance.* Paris: Author.

Orthner, K.D., & Randolph, A.K. (1999). Welfare reform and high school dropout patterns for children. *Children and Youth Service Review*, 21(9), 881-900.

Overseas Development Institute. (2010). *Rebuilding basic education in Cambodia: Establishing a more effective development partnership.* ODI Publisher: London.

Peng, S. S. (19985). *High school dropouts: A national concern.* Washington, DC: National Center for Education Statistics.

Randolph, A.K., Fraser, W. M., & Othner, K.D. (2006). A strategy for assessing the impact of time-varying family risk factors on high school dropout. *Journal of Family Issues*, 27(7), 933-950.

Randolph, A. K., Fraser, W. M., & Othner, K.D. (2004). Educational resilience among youth at risk. *Substance Use & Misuse*, 39(5), 747-767.

Rao, N., & Pearson, V. (2009). Early childhood care and education in Cambodia. *International Journal of Child Care and Education Policy*, 3(1), 13-26.

Reisel, L., & Brekke, I. (2010). Minority dropout in higher education: A comparison of the United States and Norway using competing risk event history analysis. *European Sociological Review*, 26, 691-712.

Reynolds, J.A., Temple, A.J., Ou, S., Robertson, L.D., Mersky, P. J., Topitzes, W.J., et al. (2007). Effects of a school-based, early childhood intervention on adult health and

well-being. *Archives of Pediatrics & Adolescent Medicine*, 161(8), 730-739.

Roebuck, M. C., Michael, R. F., & Michael, L. D. (2004). Adolescent marijuana use and school attendance. *Economics of Education Review*, 23, 133-141.

Roderick, M. (1994). Grade retention and school dropout: Investigating the association. *American Education Research Journal*, 31(4), 729-759.

Rosati, C. F., & Rossi, M. (2003). Children working hours and school enrollment: Evidence from Pakistan and Nicaragua. *World Bank Economic Review,* 17(2), 283-295.

Rosenberg, M. (1965). *Society and the adolescent self-image.* Princeton, NJ: Princeton University Press.

Rumberer, R.W. (1983). Dropping out of high school: The influence of race, sex, and family background. *American Educational Research Journal*, 20, 199-220.

Rumgerer, R.W. (1987). High-school dropout: A review of issues and evidence. *Review of Educational Research*, 57, 101-121.

Rumberer, R. W., & Lim, A.S. (2008, October). *Why students drop out of school: A review of 25 years of research* (Research Report No. 15). Retrieved from California Dropout Research Project website: http://www.cdrp.ucsb.edu/pubs_reports.htm

Shannon, G. Sue and Bylsma, Pete (2003). *Helping Students Finish School: Why Students Drop Out and How to Help Them Graduate*. Office of Superintendent of Public Instruction, Olympia, WA.

Singer, J. D., & Willett, J. B. (1993). It's about time: Using discrete-time survival analysis to study duration and the timing of events. *Journal of Educational Statistics, 18*, 155-195.

Singer, D. J., & Willett, B. J. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. New York: Oxford University Press, Inc.

Spady, W. (1970). Dropouts from higher education: An interdisciplinary review and synthesis. *Interchange,* 1, 109-121.

St. John, E.P., & Starkey, J.B. (1995). Analysis of large-scale secondary data in higher education research: Potential perils associated with complex sampling designs. *Research in Higher Education*, 42(5), 517-540.

Staff, J. & Kreager A. D. (2008). Too cool for school? Violence, peer status and high school dropout. *Social Forces,* 78(1), 446-471.

Stringfield, S. & Nunnery, J. (2010). Whole school designs for enhancing student achievement. In P. Peterson, E. Baker & B. Mcgaw (Eds.), *International Encyclopedia of Education* (3rd Ed., pp 303-309). Retrieved from

http://www.sciencedirect.com/science/article/pii/B9780080448947010915

Swada, Y., & Lokshin, M. (2001, February). *Household schooling decisions in rural Pakistan* (Issue Brief No. 2541). Washington, DC: Development Research Group, World Bank.

Sylwester, K. (2003). Enrolment in higher education and changes in income inequality. *Bulletin of Economic Research*, 55(3), 249-262.

Texas Education Agency [TEA]. (2006). *Secondary school completion and dropouts in Texas public schools, 2004-2005* (Document No. GE0660106). Austin, Texas: Author.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, 45, 89-125.

United Nations Development Programme [UNDP]. (2000). *Cambodia human development report 2000: Children and employment.* Phnom Penh: United Nations Development Programme.

UNESCO. (1984). *The Drop-Out problem in primary education: Some case studies*. Bangkok: UNESCO Regional Office for Education in Asia and the Pacific.

UNESCO. (2005). *Children out of school: Measuring exclusion from primary education.* Montreal: UNESCO Institute for Statistics.

Valesco, E. (2001). *Why are Cambodian girls not in schools?* Retrieved January 31, 2008, from http://www.unescobkk.org/fileadmin/user_upload/appeal/whygirls.pdf

Vermunt, K.J., & Moors, G. (n.d.). *Event history analysis*. Retrieved April, 15, 2012, from http://spitswww.uvt.nl/~vermunt/tekle2010.pdf

Werblow. J. (2009). The impact of high school size on math achievement and dropout rate. *The High School Journal*, 92(3), 14-23.

Wheeler, C. (1998). *Rebuilding technical capacity in Cambodia.* Phnom Penh: UNICEF/Sida.

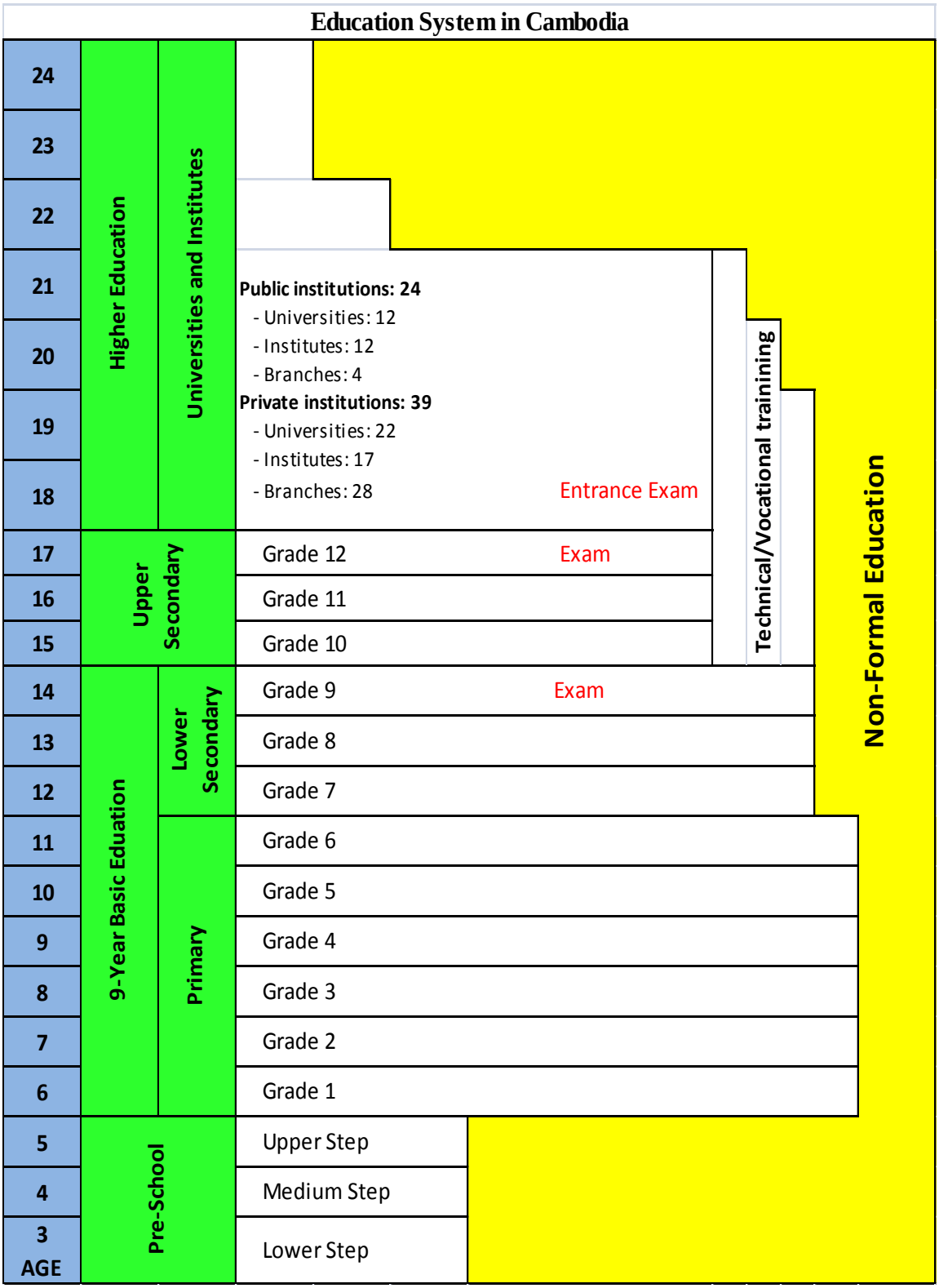
Willett, B. J., & Singer, D. J. (1991). From whether to when: New methods for studying student dropout and teacher attrition. *Review of Educational Research,* 61(4), 407-450.

Wils, A. (2004). Late entrants leave school earlier: Evidence from Mozambique. *International Review of Education, 50*, 17-37.

World Bank. (2005, January). *Cambodia: Quality basic education for all* (Rep. No. 32619-KH). Phnom Penh: Author.

APPENDICES

Appendix A


Education System in Cambodia
24
23
22
21
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
3
AGE
Higher Education
Universities and Institutes
Public institutions: 24
- Universities: 12
- Institutes: 12
- Branches: 4
Private institutions: 39
- Universities: 22
- Institutes: 17
- Branches: 28
Entrance Exam
Technical/Vocational trainining
Non-Formal Education
Upper Secondary
Grade 12
Exam
Grade 11
Grade 10
9-Year Basic Eduation
Lower Secondary
Grade 9
Exam
Grade 8
Grade 7
Primary
Grade 6
Grade 5
Grade 4
Grade 3
Grade 2
Grade 1
Pre-School
Upper Step
Medium Step
Lower Step

Appendix B.1

Code: _____

QUESTIONNAIRE

Please read each question carefully and answer as accurately as you can, by <ticking> a box. For a few questions, you will need to write a short answer. If you make a mistake when <ticking> a box, cross out your error and mark the correct box. If you make an error when writing an answer, simply cross it out and write the correct answer next to it. You may ask for help if you do not understand anything or are not sure how to answer a question.

In this questionnaire, there are no 'right' or 'wrong' answers. Your answers should be the ones that are 'right' for you. Your answers will be combined with others to make totals and averages in which no individual can be identified. All your answers will be kept confidential**.**

*Please **answer** the following questions or **tick (✓)** the box or boxes that are relevant to you.*

Section 1: About You

1. Are you <female> or <male>?
   ☐ Male ☐ Female
2. How old are you? Or if you cannot remember it, what is your birth sign?
   _____
3. How is your health condition?
   ☐ Good ☐ Normal ☐ Not good
4. To what extent do you agree with the following statements about yourself?
   a. I can do things as well as the others can.
   ☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree
   b. I feel I am a useless person.
   ☐ Strongly agree ☐ Agree ☐ Disagree ☐Strongly disagree

Section 2: Your Education

5. Have you ever attended kindergarten or unofficially enrolled in grade one?
   ☐ No ☐ Yes
6. How old were you when you started grade one?
   _____

7. How many times did you ever repeat the grade?

☐ No, never ☐ Once ☐ Twice
☐ Three times ☐ Four times or more

8. In the last two full weeks you were in school, how many times were you absent from the class?

☐ No, never ☐ Once ☐ Twice
☐ Three times ☐ Four times or more

9. Are you now involved in any private classes?

☐ Yes ☐ No

10. Which of the following do you wish to complete?

☐ University ☐ Upper secondary ☐ Lower-secondary
☐ Elementary school ☐ Stopping schooling as soon as possible

11. How often do you finish the assigned homework given by your teacher?

☐ Never because my teacher has never given any homework
☐ Never ☐ Rarely ☐ Sometimes
☐ Often ☐ Always

<u>Section 3:</u> Your Family

12. What is the highest level of education has your mother finished?

☐ Never attended school ☐ Primary school ☐ Junior high school
☐ Senior high school ☐ Bachelor or higher

13. What is the highest level of education has your father finished?

☐ Never attended school ☐ Primary school ☐ Junior high school
☐ Senior high school ☐ Bachelor or higher

14. What is the highest education level do you parents/guardians expect you to complete?

☐ University ☐ Upper secondary ☐ Lower-secondary
☐ Elementary school ☐ Stopping schooling as soon as possible

15. What is your house wall made of?

☐ Brick ☐ Wood ☐ Thatch

16. Which of the following items do you have at home? *(you can tick more than one.)*

	No	Yes
a. Bicycle	☐ 0	☐ 1
b. CD player	☐ 0	☐ 1
c. Television	☐ 0	☐ 1
d. Motorbike	☐ 0	☐ 1
e. Cellular phone	☐ 0	☐ 1
f. Car	☐ 0	☐ 1
g. Electricity	☐	☐
h. Running Water	☐	☐

17. Do you live with your parents?

☐ Yes ☐ No, my parents are working/living in other place.

☐ No, I live with my mum. ☐ No, I live with my dad.

☐ No, both of them passed away.

18. Are your parents still living together?

☐ Yes ☐ No, they were divorced.

☐ Other options

19. How many brothers and sisters do you have? *(excluding yourself)*

☐ 0 ☐ 1 ☐ 2 ☐ 3 ☐ 4

☐ 5 ☐ 6 ☐ _____(specify)

20. What sibling order are you at?

☐ 1st ☐ 2nd ☐ 3rd ☐ 4th ☐ 5th

☐ other _____

21. Are there any chronically ill persons in your family?

☐ Yes ☐ No

22. How often do you receive teaching at home?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often ☐ Most of the time

23. How much time do you help your parents with household chores and business a day?

☐ 0 – 0.5 hour ☐ 0.5 – 1 hour ☐ 1 – 2 hours

☐ 2 – 3 hours ☐ 3 – 5 hours ☐ More than 5 hours

24. How far is it from your house to school?

☐ 0 – 0.5 km ☐ 0.6 – 1 km ☐1.1 – 2 km ☐ 2.1 – 3km
☐ 3.1 – 4km ☐ 4.1 – 5km ☐ More than 5 km

25. How do you come to school?

☐ On foot ☐ By bike ☐ By motor-bike
☐ others_____

<u>Section 4</u>: Your schooling experience

26. Now how many friends do you have in your class and in this school?

☐ A lot ☐ Some ☐ A few ☐ Almost no ☐ No

27. Do you have a good relationship with your friends?

☐ Very good ☐ Good ☐ Neutral ☐ Not quite good
☐ Not good at all

28. Do you like your teachers?

☐ Very good ☐ Good ☐ Normal ☐ Bad ☐ Very bad

<u>Section 4:</u> Your community

29. How often does crime happen in your community?

☐ Never ☐ Rarely ☐ Sometimes ☐ Often

30. Are there people doing drug in your village? Around how many of them have you heard doing drug in your village?

☐ None of them ☐ 1 – 5 people ☐ 6 – 10 people
☐ 11 – 20 people ☐ 21 – 30 people ☐ more than 30

Thank you so much for your kind participation!

Appendix B.2 : School Management Checklist

School Management
Observation Checklist

School: _____
Date: ___/___/_____

A. Staff affair

1. give evaluation	1	2	3	4	5
2. have staff record book	1	2	3	4	5
3. conduct pro. Development	1	2	3	4	5
4. check absenteeism	1	2	3	4	5
5. check lateness	1	2	3	4	5
6. give balanced workload	1	2	3	4	5
7. check work progress	1	2	3	4	5
8. Enough staff to work	1	2	3	4	5
9. relation with staff	1	2	3	4	5

B. Student affair

1. control student attendance	1	2	3	4	5
2. identify student problems	1	2	3	4	5

3. student statistics	1	2	3	4	5
4. keep discipline in students	1	2	3	4	5

C. Financial affair

1. flexibility in finance	1	2	3	4	5
2. make best use of limited fund	1	2	3	4	5
3. fund raising	1	2	3	4	5
4. transparent expenditure	1	2	3	4	5

D. Administrative affair

1. Keep files	1	2	3	4	5
2. Record school events	1	2	3	4	5
3. Clear school schedule	1	2	3	4	5
4. Organize regular meeting	1	2	3	4	5

E. Curriculum affair

1. check implementation of school curriculum	1	2	3	4	5
2. control level of appropriateness in teaching	1	2	3	4	5

F. Logistics

1. Keep record of resource	1	2	3	4	5
2. Fair distribution of teaching materials.	1	2	3	4	5
3. timely procurement maintain buildings	1	2	3	4	5
4. check it safety level of the building	1	2	3	4	5

Appendix B.3 : School variables

Main factors	Variables
School factor	**Time to learn:** Total time school in session over school year Time lost to unscheduled closures Time lost to teachers' absences Time lost to teachers' lateness Time lost due to discipline/punishment Time lost to students' extracurricular duties
	Facilities **Infrastructure**: Buildings, Classrooms, Sports facilities, Science labs, Library **Equipment:** Desks, Blackboards, Telephone Duplicating equipment **Amenities:** Toilets, Electricity, Water
	Instructional materials Textbooks Maps and charts Lab equipment Sports equipment* Library books
	Teaching staff **Quantity:** Student/teacher ratio Sex ratio **Quality:** Training Supervision Experience Workload Remuneration

	Other staff: Supervisors Student advisor Nurse or doctor
	Community support Political support
	Orderliness and organization Vandalism Class schedule disruption Enforcement of uniforms
	Classroom dynamics Use of instructional time Language spoken Students' participation Teachers' treatment of students Classes streamed by ability
	School policies Dropout prevention Dropout determinants Expectation for each students Corporal punishment Streaming students (track policy)
	Interaction outside classroom: Student to student Teacher to student School to students' families Teachers to students' families
	Teachers' incentives Teachers' motivation Extra money needed to pay to teacher Force students to private classes

	Unfriendly school environment Physical punishment Allow no parental involvement No intervention to bullying or at-risk students

Appendix B.3 : Principal Interview Checklist

Principal Interview Checklist

School: _____

Number of shifts: 1 / 2 / 3

1. How many shifts are there in your school? _____
2. How long have you been in teaching position before becoming a principal? ____Years
3. How long have you been a principal in this school? _____Years
4. How would you describe your working?
   ☐ Very satisfied ☐ Satisfied ☐ Neutral
   ☐ Tired of it ☐ Very tired of it
5. Why aren't you satisfied with it?

_____

_____

6. Does your school have goal or visions, especially for preventing dropouts?
   ☐ Yes ☐ No

7. What activities do you do to prevent dropouts?

_____

_____

_____

8. How often does the school have a meeting with the teachers?

_____

Note: Ask for

- The student Attendance list
- the result of Grade 1, 4 and 7

Appendix B.4 : Teacher Interview Checklist

Teacher Interview Checklists

Teacher: _____

1. Gender ☐ Male ☐ Female

2. How many shifts do you teach this academic year?

☐ None ☐ 1 ☐ 2

3. How long have you been in teaching position? _____ years

4. What is the highest education level did you obtain?

☐ Bachelor's degree or higher ☐ Upper secondary school

☐ Lower secondary school ☐ Primary school

5. How long have you experienced pre-service training? _____ Years / Months

6. Have you ever received any in-service training?

☐ No ☐ Yes (How long: _____ Years / Months)

7. Do you feel tired of teaching?

☐ Very tired ☐ Tired ☐ Normal

☐ Not very tired ☐ Not tired at all

8. If you happen to get another job, will you stop your teaching?

☐ Absolutely stop ☐ Maybe stop ☐ think first before stopping

☐ Maybe not ☐ Not at all

9. Besides teaching, do you have any other jobs?

_____(please specify)

10. Are there some factories that hire young workers?

☐ A lot ☐ Some ☐ A few ☐ No

Appendix C.1: Estimates of dropout with TVC models for cohort 1 (Grades 1-3)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-0.400	-0.665*	-0.367				-0.326
Preschool experience (No)	1.311	0.922	0.881				0.832
Age at first entry to school	0.333***	0.35***	0.289***				0.246**
Ethnicity (Khmer)	0.247	0.005	-0.172				-0.308
Commute distance	0.249	0.211	0.269				0.293
Repetition		-0.088	0.011				-0.044
Relative Achievement		-0.075	0.043				-0.049
Absences		0.469***	0.396**				0.363*
Homework completion		-0.168	-0.153				-0.109
Time helping family		0.076	0.045				0.072
Education aspiration			-0.112				-0.108
Self-esteem			0.051				0.113
Relationship with others			-0.479***				-0.437**
Relationship with teachers			-0.037				-0.033
Family economic status				-0.325*	-0.245		-0.224
Parents' education aspiration				-0.146	-0.132		-0.052
Academic support from family				-0.143	-0.131		-0.073
Parents' educational Attainment				-0.115	-0.111		-0.046
Present of both parents (Presence of both parents at home)					0.018		-0.129
Divorced parents (Divorced family)					1.294***		0.91***
Parentless (Decease of parent(s))					0.066		0.031
Family size					0.382		0.419
School ID							
School ID(1)						-13.440	
School ID(2)						-1.135**	
School ID(3)						.137	
School ID(4)						-.349	
- 2 Log Likelihood	760.38	737.56	721.13	821.16	800.90	815.80	705.72

Note: **p < .05, ** p< .01, *** p< .001*

Appendix C.2: Estimates of dropout with TCC models for cohort 1 (Grades 1-3)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-.365	-.523*	-.490				-.429
Preschool experience (No)	1.388	1.069	1.109				1.166
Age at first entry to school	.318***	.347***	.340***				.307***
Ethnicity (Khmer)	.237	.061	-.018				-.157
Commute distance	.225	.171	.124				.137
Repetition		-.111	-.039				-.070
Relative Achievement		-.087	-.069				-.078
Absences		.348**	.351**				.289*
Homework completion		-.091	-.107				-.040
Time helping family		.005	.006				.016
Education aspiration			.027				.052
Self-esteem			.118				.173
Relationship with others			-.034				-.063
Relationship with teachers			-.101				-.155
Family economic status				-.364*	-.317		-.280
Parents' education aspiration				.042	.047		-.009
Academic support from family				.007	.015		.021
Parents' educational Attainment				-.143*	-.144*		-.074
Present of both parents (Presence of both parents at home)					-.112		.226
Divorced parents (Divorced family)					1.204***		.875
Parentless (Decease of parent(s)					.080		-.006
Family size					.414		.473
School ID							
School ID(1)						-13.440	
School ID(2)						-1.135**	
School ID(3)						.137	
School ID(4)						-.349	
- 2 Log Likelihood	795.60	782.92	780.53	825.79	814.85	815.80	768.23

Note: **p < .05, ** p< .01, *** p< .001*

Appendix C.3: Estimates of dropout with TVC models for cohort 2 (Grades 4-6)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-.423*	-.462*	-.366				-.342
Preschool experience (No)	1.418**	1.186*	1.120*				1.096*
Age at first entry to school	.171*	.201*	.206**				.195*
Ethnicity (Khmer)	-.894***	-1.214***	-1.079***				-.944***
Commute distance	.196	.184	.166				.184
Repetition		.334**	.274*				.251*
Relative Achievement		-.512***	-.491***				-.484***
Absences		.184*	.169*				.173*
Homework completion		-.309**	-.275*				-.281*
Time helping family		.056	.056				.066
Education aspiration			-.037				.006
Self-esteem			-.153				-.182*
Relationship with others			-.013				-.005
Relationship with teachers			-.066				-.062
Family economic status				.083	.102		.114
Parents' education aspiration				-.308***	-.303***		-.101
Academic support from family				-.189*	-.177		-.004
Parents' educational Attainment				-.066*	-.066*		-.018
Present of both parents					-.015		.006
Divorced parents					-.064		.100
Parentless					.399		.085
Family size					.002		.026
School ID							
School ID(1)						-13.425	
School ID(2)						-.543	
School ID(3)						-.386	
School ID(4)						.538	
- 2 Log Likelihood	1299.56	1237.17	1233.70	1330.26	1328.06	1317.07	1230.12

Note: **p < .05, ** p< .01, *** p< .001*

Appendix C.4: Estimates of dropout with TCC models for cohort 2 (Grades 4-6)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-.423*	-.401*	-.366				-.355
Preschool experience (No)	1.418**	1.269**	1.257**				1.267**
Age at first entry to school	.171*	.210**	.210**				.189*
Ethnicity (Khmer)	-.894***	-1.294***	-1.285***				-1.270***
Commute distance	.196	.163	.162				.174
Repetition		.396***	.375**				.366**
Relative Achievement		-.536***	-.534***				-.530***
Absences		-.005	-.004				-.014
Homework completion		-.267*	-.272*				-.283*
Time helping family		.055	.059				.066
Education aspiration			.001				.025
Self-esteem			-.061				-.080
Relationship with others			-.010				.005
Relationship with teachers			.037				.023
Family economic status				.087	.112		.044
Parents' education aspiration				-.279**	-.273**		-.101
Academic support from family				-.031	-.026		-.004
Parents' educational Attainment				-.077*	-.075*		-.018
Present of both parents					.068		-.012
Divorced parents					-.089		.228
Parentless					.463		.287
Family size					.003		.052
School ID							
School ID(1)						-13.425	
School ID(2)						-.543	
School ID(3)						-.386	
School ID(4)						.538	
- 2 Log Likelihood	1299.56	1246.63	1245.96	1343.26	1339.50	1317.07	1243.70

Note: **p < .05, ** p< .01, *** p< .001*

Appendix C.5: Estimates of dropout with TVC models for cohort 3 (Grades 7-9)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-.020	-.290	-.064				-.056
Preschool experience (No)	2.341***	2.096***	1.968***				1.893***
Age at first entry to school	.112	.181*	.160				.121
Ethnicity (Khmer)	.187	.312	.141				.151
Commute distance	.078	-.041	-.029				-.021
Repetition		.403***	.343**				.348**
Relative Achievement		-.315**	-.232**				-.227**
Absences		.332**	.288*				.251*
Homework completion		-.170	-.108				-.100
Time helping family		-.013	-.014				-.016
Education aspiration			-.259*				-.201
Self-esteem			-.172*				-.146*
Relationship with others			.037				.046
Relationship with teachers			-.201				-.214
Family economic status				-.233*	-.254*		-.099
Parents' education aspiration				-.249**	-.224*		-.020
Academic support from family				-.307***	-.297***		-.140
Parents' educational Attainment				-.034	-.028		-.012
Present of both parents					.393		-.027
Divorced parents					.558		.180
Parentless					.568		.059
Family size					.060		.058
School ID							
School ID(1)						-1.093***	
School ID(2)						-.646**	
School ID(3)						-.439	
School ID(4)						-.651*	
- 2 Log Likelihood	1287.72	1235.41	1219.95	1741.84	1738.34	1787.34	1214.78

Note: **p < .05, ** p< .01, *** p< .001*

Appendix C.6: Estimates of dropout with TCC models for cohort 3 (Grades 7-9)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
	B	B	B	B	B	B	B
Gender (Male)	-.091	-.292	-.155				-.131
Preschool experience (No)	2.363***	2.195***	2.120***				2.081**
Age at first entry to school	.163*	.247***	.205**				.168*
Ethnicity (Khmer)	.319	.257	.141				.121
Commute distance	.074	.005	.001				.008
Repetition		.410***	.373***				.346**
Relative Achievement		-.393***	-.331***				-.304***
Absences		.055	.057				.053
Homework completion		-.153	-.075				-.081
Time helping family		-.027	-.016				-.028
Education aspiration			-.252**				-.152
Self-esteem			-.130				-.119
Relationship with others			.001				.030
Relationship with teachers			-.093				-.137
Family economic status				-.253*	-.284**		-.135
Parents' education aspiration				-.225**	-.210*		-.159
Academic support from family				-.216*	-.202*		-.129
Parents' educational Attainment				-.036	-.027		-.011
Present of both parents					-.726		-.455
Divorced parents					.901*		.453
Parentless					.988*		.490
Family size					.065		.056
School ID							
School ID(1)						-1.093***	
School ID(2)						-.646**	
School ID(3)						-.439	
School ID(4)						-.651*	
- 2 Log Likelihood	1716.67	1663.71	1650.70	1754.10	1747.16	1787.34	1640.45

Note: **p < .05, ** p< .01, *** p< .001*