



Determinants of student achievement at lower secondary schools in rural Cambodia

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Abstract

This study examines the effects of student-, family-, and school-related factors on student achievement at lower secondary schools in rural Cambodia. To investigate the determinants of student achievement, a survey study was conducted in four rural districts, including 20 lower secondary schools for investigation. A total of 517 seventh graders were randomly selected for the study. Questionnaires and achievement tests were utilized as tools for data collection. Due to the nested and hierarchical structure of data, a two-level hierarchical linear model was employed to assess what factors may have affected student achievement. The results indicated that absenteeism and private-tutoring attendance significantly affected student achievement. The negative effect of absenteeism has highlighted the critical roles of parents, teachers, and related educational stakeholders to ensure that students come to school on a regular basis. Despite the positive effect on achievement, private tutoring has greatly disadvantaged Cambodian students from financially disadvantaged backgrounds. In contrast to some existing findings, significant effects were not found among family and school factors. The findings make up the empirical evidence needed for the development of improved education policy and practice in Cambodia.

Keywords Academic achievement · Lower secondary school · Hierarchical linear model · Rural · Cambodia

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1 Introduction

To grow from a developing country to an upper middle-income country by 2030, Cambodia has been involved in many international development agendas, such as Sustainable Development Goals (SDGs) or the Program for International Student Assessment (PISA). One of the Cambodian government's primary endeavors is to produce highly qualified human resources in the short term and maintain sustainable economic growth for the long term. In this regard, the education sector has been embraced as an important way to drive Cambodia toward achieving both its ambition and SDGs. Contemporarily, Cambodia education reform has been designed to generate higher student achievement. Student achievement has been an important topic for discussion among researchers, educators, and policymakers for decades. Student achievement has been defined as learned proficiency in basic skills and content knowledge (McCoy et al. 2005).

Understanding the main determinants of student achievement is a constant concern of the Ministry of Education, Youth, and Sport (MoEYS), since it is one of the keys for educational development prospects in Cambodia. In sub-sectors, MoEYS has increased focus on various aspects of lower secondary education through the implementation of the Education Strategic Plan (ESP) 2014–2018, in line with the National Strategic Development Plan (NSDP) 2014–2018.

To promote student achievement in all educational levels, MoEYS has developed and conducted a standardized national assessment for policy development and evaluation. This assessment measured student achievement in Khmer language and Mathematics with students in grades three and six, and Khmer language, Mathematics, and Physics with eight graders. The results of the national assessments for grade eight in the academic year 2013–2014, for instance, showed that grade eight students nationwide answered the tests correctly by 55.6% for Khmer language, 44% for Mathematics, and 52.8% for Physics (MoEYS 2017a). These results indicate that students achieved only the minimal level of proficiency in all tests.

After a long-standing delay for signing up to PISA, Cambodia successfully implemented the PISA for Development (PISA-D) test with 15-year-old students in December 2017 as a pilot project (Auld et al. 2019). The implementation of PISA-D has been deemed to drive improvement in achievement, attainment, well-being, and engagement with learning for Cambodian students. The test results not only reflect where Cambodia's education system is but also provide policymakers with clear perspectives to set policy target against measurable goals that other countries have achieved (MoEYS 2018). This type of international testing system enables Cambodia, a country that signed up to the Education SDG agenda, to ensure that each child reaches at least a basic level of proficiency in mathematics and reading. The results of this test showed that only 8% of students achieved the minimum level of proficiency in reading and only 10% achieved the minimum level of proficiency in mathematics. It was found that girls outperformed boys in reading, and their performance in mathematics was similar. Grade retention was found to have a strong negative effect on student achievement in the PISA-D test in Cambodia's context (MoEYS 2018).

In recent years, a large volume of studies has investigated factors that might influence student achievement in various education systems and countries. However, research to date has focused more on primary education rather than lower secondary or upper secondary education. In Cambodia, several studies on student achievement have also dedicated more attention to primary education (e.g., Eng 2013; Nguon 2012). These studies have contributed to many aspects of education reform in primary education in Cambodia, especially curriculum and assessment development. The study of student achievement at higher educational

levels has been embraced as an emerging paradigm to respond to Cambodia's new education reform agendas. Cambodia aims to become a middle-income country by 2030, so the quality of education is one of the keys to achieving this. The Royal Government of Cambodia (RGC) (2015) has indicated that to maintain sustainable economic growth, Cambodia needs a workforce that has at least completed lower secondary education and obtained sufficient proficiency in reading and mathematics to acquire new skills.

The main purpose of this study was to determine the individual student-, family-, and school-related factors that may have influenced student achievement at lower secondary schools in rural Cambodia. Predictor variables of the current study were gathered through questionnaires and achievement tests assessing math and Khmer-language skills. This study investigates in depth the factors at student and school levels through a two-level HLM, engages in a concrete discussion of these factors, and concludes which factors may have significantly affected student achievement. The results of this study will provide informative and empirical evidence for the development of improved education policy and practice in Cambodia.

2 Literature review

2.1 Student factors

At the student level, absenteeism or missing class has been found to have a strong effect on student achievement (Roby 2004). A study in a UK university suggested that absenteeism had an adverse causal effect on student achievement. The results from the model in which absenteeism was considered to be exogenous of the quantile regressions showed that students who were absent from 10% of their classes were associated with an approximately 1.5% loss in the average score of their three core courses (Arulampalam et al. 2012). In addition, Zappalà and Considine (2001) argued that the unexplained absences significantly influenced student achievement. They claimed that an increased number of days of absence resulted in a significant decline in student achievement for both sexes. A large volume of studies has shown that students with minimal class performance did not only underperform but also often faced a high likelihood of dropping out of school (e.g., Neild 2009; Traag and Velden 2008). Furthermore, the literature shows that grade retention also has a significant effect on student achievement. Retaining low-achieving students in the same grade has become increasingly popular in the public-school systems of various countries, especially developing countries. However, students with high repetition rates have been typically found to underperform compared to their peers. Retained students were found to not only have low academic achievement but also be likely to have experienced numerous school changes and absences (Anderson et al. 2002).

In past decades, very few studies have investigated the effect of private tutoring on student achievement. Additionally, several of those limited studies have been conducted in developing countries. Three studies in Cambodia (Brehm and Silova 2014), Vietnam (Dang 2008), and Korea (Lee 2013) investigated private tutoring as a predictor of student achievement and found private tutoring to be one of the main mediators improving student achievement. However, all studies have argued that private tutoring strongly perpetuates educational inequality between high- and low-achieving students, especially students from low-income and high-income households. In Cambodia's context, it has created stratification among students at public schools based on their socioeconomic status (Brehm and Silova 2014). Results in the literature

suggest additional factors that might affect student achievements, such as late school entry (Ordine and Rose 2018), academic expectations (Tella 2007), and disability (Westendorp et al. 2011).

2.2 Family factors

At the family level, while several studies have shown that students' characteristics have strong influences on student achievement, policymakers and related educational stakeholders seem to have paid little attention to the relationship between educational achievement and family-related factors. The literature has shown that the education level of students' parents is a strong predictor for student achievement. Several studies have indicated that the educational attainment of parents indirectly influences children's achievement. Davis-Kean (2005) argued that parental education affected children's achievement through their beliefs and behaviors toward their children's education. In his cross-sectional study, Davis-Kean (2005) found that parental education level, parents' education expectations, reading, and the parent-child interactions indirectly affected student achievement (see Davis-Kean 2005). Strong beliefs and high expectations of educated parents created positive post-schooling endeavors that benefited children's achievement (Alexander et al. 1994). However, some previous studies have shown that parental education also has a direct impact on children's achievement (e.g., Acharya and Joshi 2009; Schreiber 2002).

In recent years, there has been an increasing number of studies investigating student achievement and socioeconomic status (SES), which has been deemed as the most important factor to examine at the family level. Lareau (2011) claimed that parents of low-income households were unlikely to believe that their children's education was their responsibility. They were found less likely to be involved in activities supporting their children's learning at home and school. Since parents from low-income households were less educated, their awareness of the skills and knowledge that they contributed to their children's schooling was limited. In addition, parents of low-income families seemed to have jobs requiring them to work long hours, which hindered the affordability of their involvement (Hoover-Dempsey et al. 2005). Henderson and Mapp (2002) also found that family engagement could greatly improve student achievement. Families had a direct impact on both children's attendance and behavior at school. Low-achieving children benefited as their families engaged in supporting their learning at home.

The finding that students from larger families are more likely to have low achievement has been well-established in many studies, especially in developing countries. Students from large families typically have low performance due to the link between expenditure per child, the number of children in the household (Le and Miller 2002) and having a single-parent family (Pong et al. 2003). Riala et al. (2003) also found that large family size was also a factor that led to student's underperformance in their adulthood in the long run.

2.3 School factors

In recent years, the question of what school-level policies and practices will most improve student achievement in public schools has gained increasing prominence. Some studies have claimed that teacher-related factors are the most important for policy discussions, while others have argued that school climate and school resourcing are the most important factors in improving student achievement. However, the diverse literature showing results of student

success has yielded mixed conclusions about how student achievement is linked to teacher-related factors, school climate, and school resourcing.

According to a large volume of literature, teacher-related factors strongly determine student learning outcomes. Akey (2006) found that to improve student achievement, students needed strong engagement and positive perception of their own academic competence, which could be enriched through the help of teachers. Akey (2006) suggested that teachers' support and high behavioral expectations could develop students' engagement and perceived competence. As students see supportive teachers set clear expectations about behavior, they feel confident and in control of their future educational success. It significantly improves their achievement at the classroom level.

In addition, many studies have shown a well-established link between school climate and student achievement (e.g., Hoy and Sabo 1998; Uline and Tschannen-Moran 2008). Positive school climate is a vital factor enhancing student achievement and attitude. In the Uline and Tschannen-Moran's (2008) study, they investigated the effects of quality facilities and school climate on student achievement. The findings showed that school-climate index had a strong correlation with student achievement. They also showed that school facilities had a significant and positive relationship with student achievement, while school climate itself was also related to the quality of school facilities. Basically, a healthy learning environment is an important school-climate variable. MacNeil et al. (2009) suggested that students could reach high achievement on standardized tests in schools where healthy learning environments existed. A healthy, friendly learning environment motivates students to enjoy their learning and opens opportunities for academic improvement. There is also substantial evidence in the literature to strongly suggest how diverse school-climate variables affect student achievement (e.g., Leithwood et al. 2004; Mortimore 2001).

Furthermore, school distance is also a commonly investigated factor for its correlation with various educational issues in developing countries, such as school dropout and student achievement. Gottfried (2010) suggested that not many studies have focused on the direct link between student achievement and school distance. In his study, Gottfried (2010) found that school distance had a weak correlation with student achievement, but it had a strong correlation with student attendance. The increase in mileage from school to home led to significantly decreased student attendance in urban elementary and middle schools.

3 Theoretical framework

The HLM has been employed by various researchers to examine the effects of various factors on student achievement (e.g., Abbott et al. 2002; Daly et al. 2014). Yet, only a few variables were investigated, and no studies have developed a specific framework to examine the determinants of student achievement. Unlike previous studies, the present study has extended the analysis which covers more variables. After reviewing extensive existing literature, three groups of variables, namely individual student, family, and school, considered to be relevant to the Cambodia context were developed and included in the research framework (see Fig. 1). The variables such as gender, age late school entry, repetition, absenteeism, number of siblings, education of mother and father, socioeconomic status and school distance included in the analysis also have been investigated by several studies in rural Cambodia (No et al. 2016; No et al. 2012). These variables were hypothesized to have significant effects on student achievement. Most existing studies indicate that student factors tend to have stronger effects on achievement. Family and student factors were estimated in level 1 where the outcome

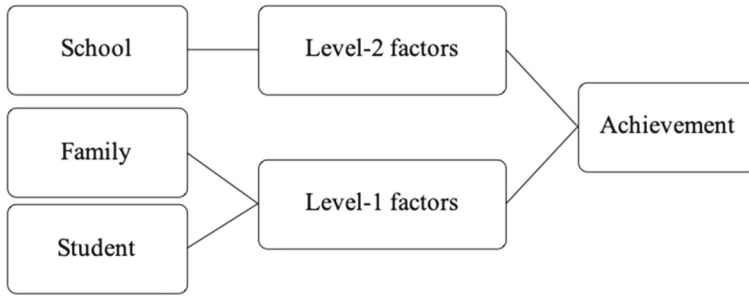


Fig. 1 The Two-level HLM model assessing determinants of student achievement

variable (achievement) was situated. In essence, the outcome variable is always located at the lowest level of the hierarchy in the HLM. And, school factors were estimated in level 2.

4 Methodology

4.1 Research design

This study adopted a purely quantitative approach by using a survey research design for the investigation. According to a growing body of literature, survey research has been commonly used by most researchers in this area to investigate student achievement. In addition, the surveys enabled researchers to obtain information from large samples of the population (Mathiyazhagan and Nandan 2010). The large sample size also strengthened the current findings' to be generalizable to other rural schools in Cambodia.

4.2 Sample

The current study targeted students at lower secondary schools in rural areas of Cambodia. This study investigated student achievement at rural areas, since Sem and Hem (2016) have found that absenteeism rates of both teachers and students is higher in rural areas compared to urban areas or cities. The researchers employed a stratified random sampling method to recruit research areas and students. First, four rural districts in Battambang Province were randomly picked from the list. After district selection, five lower secondary schools were randomly chosen in each district. From this selection process, twenty lower secondary schools from four rural districts were included for investigation. Overall, 600 grade-seven students were recruited across these schools, but only 517 students were included in the current study because students who did not complete the entire questionnaires were excluded. Grade-seven students were chosen because they were reported to have the highest repetition rate (2.7%) and dropout rate (22.6%) at the lower secondary level nationwide, according to the Education Management Information System (EMIS) in 2016 (MoEYS 2017b).

4.3 Instruments

4.3.1 Achievement tests

Math and Khmer-language tests were implemented with grade-seven students aged from 11 to 20 years old ($n = 517$, $M = 13.41$, $SD = 1.05$). The results of the test scores represent student achievement (outcome variable) in the current study. The authors developed the tests with two mathematics and Khmer-language teachers. Mathematics and Khmer language are considered the two core subjects that have a strong influence on student achievement in the Cambodian education curriculum since its monthly marking in the national curriculum is about 31.6% Khmer language and about 15.78% Mathematics (Bredenberg 2000). The achievement tests were used to measure what students had learned for the first semester of the academic year rather than testing student language and numerical abilities (e.g., proficiency test). These tests were implemented to check what students had learned as well as what they had been taught according to the set curriculum within a specific timeframe.

Each test consisted of 15 items, so the maximum score is 15. The results of descriptive statistics showed that the average achievement score ranged from 3 to 15, and the overall average score of all students was very high across schools ($n = 517$, $M = 10.21$, $SD = 2.55$). It should be noted that the outcome variable is a continuous variable. These tests were piloted as the prerequisite for the study. Cronbach's Alpha was computed to check the reliability of the results of both the piloted and actual tests. The results of the piloted tests showed that the Math test was $\alpha = .61$, and the Khmer-language test was $\alpha = .60$. The tests were then revised and used for the current study. The reliability of the actual test results was better than the reliability of the pilot test results. The actual Math test was $\alpha = .80$, and the Khmer-language test was $\alpha = .73$. These results indicated that these tests were reliable and sufficient to use for this study.

4.3.2 Questionnaire

The current study adapted the questionnaire from No and Hirakawa (2012) who also used this questionnaire in three of their studies: No et al. (2016), No and Hirakawa (2012) and No et al. (2012). To study on factors (individual-, family-, and school-related factors) at hierarchical levels, the questionnaire of their studies is most appropriate for the current study to extract those variables within the Cambodian context. This questionnaire has been piloted and used in several studies as mentioned above, which determines one of the questionnaire validation methods. The questionnaire consisted of 50 questions divided into three sections: about yourself, your education, and your family. The items in the questionnaire were multiple-choice such as checking boxes and table and blank-space completion. Each student had 30 min to fill in the questionnaire. From the questionnaire, there were 15 variables used for the analysis, including gender, age, disabilities, late school entry, repetition, absenteeism, private tutoring, number of siblings, mother education, father education, socioeconomic status, learning, environment, helpful teacher, and school distance. Among the 15 variables, SES variable was extracted using Principle Component Analysis (PCA) with Varimax rotation method with eight household belongings, including bicycle, motorbike, smartphone, DVD player, TV, car, water supply, and electricity. These items and some other items were also used by various studies in Cambodia to measure SES (e.g., No and Hirakawa 2012; No et al. 2012, 2016). The Kaiser-Mayer-Olkin was measured to verify the sampling adequacy for the analysis with $KMO = .718$ which was above the commonly recommended value of .6. The

results of the PCA analysis further showed that Bartlett's test of sphericity was significant ($\chi^2(28) = 381.813, p < .001$), indicating that correlations between items were sufficiently large for the PCA. After the rotation, a construct was extracted, and it accounted for 28.26% of the variance. The regression score from the analysis was saved as a SES variable. So, the current study used the SES variable from this analysis as an independent variable.

4.4 Procedure

The data of the current study were collected through questionnaires and math and Khmer-language achievement tests. The target schools were lower secondary schools, but some schools included three educational levels—primary, lower secondary, and upper secondary level—which are known as high schools in Cambodia. Twenty schools, including four high schools, were randomly selected from the list of each district. Due to the time limits and large sample size, the researchers could not personally administer each questionnaire and test. Since the time allotted for administering the questionnaires and tests was limited to 1 h per school, the researchers requested that the classroom teachers who were teaching at the time of the visit help administer the questionnaires and achievement tests. Therefore, the teacher of each class was involved during the data-collection process. The researchers gave rigorous instructions to the students in each class and closely observed them to make sure that cheating did not occur during the implementation process. As a result, the researchers received valid data from a total of 517 students, after excluding some incomplete questionnaires.

4.5 Data analysis

The current study employed a two-level HLM for the analysis due to the nested and hierarchical structure of the data. The two-level HLM assessed the significant determinants of student achievement by nesting student- and family-related variables at level 1 and school-related variables at level 2. The HLM employed an ordinary least squares regression to analyze the variance in dependent variables when the independent variables were at different hierarchical levels. Simple linear regression was not used due to its neglect of the variables' shared variance. The HLM accounted for the shared variance in hierarchically structured data. It accurately estimated low-level slopes and high-level outcomes (Woltman et al. 2012). To confirm that the HLM was appropriate for the current study's analysis, a null model, comprised only the intercept, was estimated to examine the variability in student achievement attributable to individual and school levels.

Three HLM models were developed to examine the significant determinants of student achievement. The level-1 model controlled the effects of school-related variables on student achievement. In this model, the intercepts and coefficients for variables related to student and family were estimated. The level-1 model was named "*individual level*," and the level-2 model was named as "*school level*." As shown in Table 2, predictor variables in the level-1 model consisted of gender, age, disabilities, late school entry, repetition, absenteeism, private-tutoring attendance, number of siblings, mother's education, father's education, and socioeconomic status. The level-2 model estimated the effects of school-related factors on student achievement by controlling student- and family-related factors. It consisted of three predictor variables: learning environment, helpfulness of teacher, and school distance. Lastly, to examine whether student-, family-, and school-related factors had effects on student achievement, a mixed model, where all predictor variables were created and added to the

Table 1 Variability in student achievement

| Unit of analysis | Variance | Proportion of variance explained (%) |
|-----------------------------------|----------|--------------------------------------|
| Between individuals ($N = 517$) | 4.91 | 75 ^a |
| Between schools ($N = 20$) | 1.65 | 25 ^b |

^aProportion of the variance explained (between individual) = $4.91/(1.65 + 4.91)$; ^bProportion of the variance explained (between school) = $1.65/(1.65 + 4.91)$

general effect equations, tested whether the existence of conditional or interaction effects was estimated by the two-level HLM.

5 Results

Table 1 presents the variability in student test scores observed in the data at each level. The null model revealed that there were statistically significant variations in student achievement across schools ($\chi^2 = 188.83$, $df = 19$, $p < .001$). The data showed that a large percentage of the variance in student achievement, roughly 75%, was attributable to individual-level factors, and about 25% of the variance was attributable to school-level factors. It indicated that much of the variation in student achievement was accounted for in individual-level factors. The large magnitude of the variance collectively observed across schools justified the use of the two-level HLM for the current study. In this regard, both fixed and random effects of the variables of interest were specified and tested to examine if their influence would vary across schools.

Table 2 shows the results of three models of the two-level HLM analysis, examining what individual student-, family-, and school-related factors affected student achievement at the individual (level 1) and school (level 2) levels. The null model was a no-predictor model. The level-1 model was a model where predictor variables related to student and family were added and estimated by controlling school-related variables. The results of the level-1 model showed that the individual level accounted for 73% of the variance in student achievement and the school level for about 27%. As shown in Table 2, only absenteeism and private-tutoring attendance exerted a significant influence on student achievement in this model. The findings suggested that absenteeism had a negative and significant effect on student achievement ($\beta = -.25$, $p < .01$). Increased student absences indicated a high risk of having low achievement across schools. Furthermore, private-tutoring attendance was found to be a significant and positive predictor variable affecting student achievement ($\beta = .29$, $p < .05$). Attending more private-tutoring classes, known as “*rien kuo*” in the Cambodian language, could largely improve student achievement.

The level-2 model indicated the influences of school-related factors on student achievement. The results of this model revealed that 73% was still attributable to the individual level and 27% to the school level. However, there were no significant predictor variables affecting student achievement in this model.

Finally, the results of the mixed model indicated the effects of all factors on student achievement at both the individual and school levels. The results of this model, in which all predictors were evaluated together showed that a large proportion in student achievement, about 72%, was accounted for in individual-level factors, and only 28% was accounted for in school-level factors. Like the results of the level-1 model, the results of the mixed model

Table 2 The HLM results for effects of student-, family-, and school-related factors on student achievement

| Variables | Null model coefficient | Level-1 model coefficient | Level-2 model coefficient | Mixed model coefficient |
|---------------------------------|------------------------|---------------------------|---------------------------|-------------------------|
| Intercept | 10.17*** | 10.17*** | 10.17*** | 10.17*** |
| <i>Individual-level effects</i> | | | | |
| <i>Student factors</i> | | | | |
| Gender | | 0.37 | | 0.37 |
| Age | | - 0.21 | | - 0.21 |
| Disabilities (physical) | | - 1.54 | | - 1.54 |
| Late school entry | | 0.01 | | 0.01 |
| Repetition | | 0.02 | | 0.02 |
| Absenteeism | | - 0.25** | | - 0.25** |
| Private tutoring | | 0.29* | | 0.29* |
| <i>Family factors</i> | | | | |
| Number of siblings | | - 0.08 | | - 0.08 |
| Mother education | | 0.18 | | 0.18 |
| Father education | | - 0.12 | | - 0.12 |
| Socioeconomic status | | 0.12 | | 0.12 |
| <i>School-level effects</i> | | | | |
| <i>School factors</i> | | | | |
| Learning environment | | | - 0.41 | - 0.41 |
| Helpful teacher | | | 0.18 | 0.18 |
| School distance | | | 0.27 | 0.27 |
| Between-individual variance | 75% | 73% | 73% | 72% |
| Between-school variance | 25% | 27% | 27% | 28% |
| Total variance explained | 100% | 100% | 100% | 100% |

* $p < 0.05$; ** $p < 0.01$

indicated that absenteeism had a significant and negative effect on student achievement ($\beta = -.25$, $p < .01$), and private-tutoring attendance had a significant and positive effect on student achievement ($\beta = .29$, $p < .05$). The findings suggest that absenteeism and private-tutoring attendance were the only two main factors that significantly affected student achievement in the two-level HLM analysis.

6 Discussions

6.1 Absenteeism

The results of the two-level HLM analysis indicated that only absenteeism and private-tutoring attendance significantly influenced student achievement in the current study. Absenteeism was found to have a negative influence on student achievement across schools. The current study has shown that a large number of students were found to be absent from classes. About 51.5% of the total students reported to be absent at least once within 2 weeks. This result is consistent with similar studies conducted in various countries (e.g., Arulampalam et al. 2012; Roby 2004; Zappalà and Considine 2001) and especially in Cambodia (e.g., Marshall et al. 2012; Sem and Hem 2016). The negative and significant effect of this factor highlights the critical role of teachers and parents to ensure that students regularly come to school and attend classes on a regular basis.

Absenteeism has become one of the key challenges that concern Cambodia's educational stakeholders. It has caused some other related issues for Cambodia's education. In rural areas, Sem and Hem (2016) argue that during the rice-planting season, students sometimes come to class late, ask permission for a long period absence, or miss school without informing teachers. Absenteeism rates among students in rural areas are very high during this season because they are obligated to assist their family with planting and cultivating rice. Besides family responsibilities, Edwards et al. (2014) argue that the lack of economic opportunities in rural areas makes parents migrate for jobs, which causes a negative influence on students' mental and emotional state and performance. In addition, previous studies in Cambodia also found that student absenteeism has a relationship with school distance (Benveniste et al. 2008), poor infrastructure (Velasco 2004), and importantly, teacher absenteeism (No et al. 2012).

6.1.1 Implications for absenteeism

At the school level, to keep students on track, homeroom teachers are supposed to ask a classmate to visit the absentee's house with a letter if he or she is absent for several days. If that student still does not come to school, homeroom teachers need to visit that absentee's home (Sem and Hem 2016). However, No et al. (2016) found that students from ten schools in their study responded that they never knew of any homeroom teachers visiting either their own home or the homes of other students who were absent for a number of days. From the family side, it has been found that Cambodian parents tend to misunderstand the importance of class attendance. Sem and Hem (2016) reported a parents' words, saying that "being absent for a few days does not make much difference."

Overall, this study suggested that: (1) teachers should closely observe students and visit their home in case they are absent for more than 3 days; (2) teachers should identify who is often absent and report to their guardians or parents immediately; (3) there should be a regular parent-homeroom teacher meeting at least once a month; and (4) parents should closely observe their children's learning at home, have regular meetings with homeroom teachers, and ensure that their children attend school regularly.

6.2 Private tutoring

For the past decades, few studies have investigated the effect of private-tutoring attendance on student achievement. It has escaped the attention of researchers, policymakers, educational planners, and decision-makers (Bray 1999). The results of the current study revealed that private-tutoring attendance had a significant and positive influence on student achievement. This finding is also consistent with a few studies in developing countries, such as Brehm and Silova (2014) and Edwards et al. (2019) in Cambodia, Dang (2008) in Vietnam, and Lee (2013) in Korea. These studies have highlighted that private tutoring is one of the main perpetrators of educational inequality. Students from disadvantaged backgrounds do not benefit from private tutoring due to the unaffordability of monthly fees.

In the Cambodian context, private-tutoring attendance has been known as “*rien kuo*,” and students and parents believe that it determines the success of Cambodian public schooling. The most common subjects that students study at private-tutoring classes are mathematics, Khmer literature, physics, chemistry, biology, and English. Students typically take these classes in the early morning before their formal schooling hours, during the afternoon break, or in the evening after formal class sessions. The number of classes they take is determined by their socioeconomic status. The low-income families might let their children take just a few private-tutoring classes, while the high-income families might let their children choose the classes they desire.

The results of this study showed that students more involved in this type of instruction tended to have better achievement than other students. Thus, this study concludes that only a combination of public schooling and private tutoring can create educational success for students in the context of a developing country like Cambodia. This phenomenon might occur due the Brhem and Silova’s (2014) findings, which argued that the curriculum of Cambodia’s formal education is split for public and private classes by teachers. It was claimed that to receive the full curriculum and pass the exam, students needed to take private-tutoring classes (Brehm and Silova 2014). Edwards et al. (2019) found that students who do not take the private-tutoring class typically fail the exam. The findings of the current study, in line with earlier studies, indicate that this issue has been hindering the achievement goals of Education for All (EFA), education equity, Sustainable Development Goal 4 (SDG4), and especially education equality.

6.2.1 Implications for private tutoring

This study suggests some specific implications. First, the current study recommends increasing the curricular content of public schools. Though some students might not be able to attend private tutoring, they should remain eligible to receive the full curriculum in public-class sessions. The curriculum should not be split for public and private classes as Brehm and Silova (2014) found in Cambodia’s general education system. Second, the curriculum should target students with average ability. The curriculum should be designed to meet the needs of students with different abilities in public schools. Third, scholarship should target students from a financially disadvantaged background. These findings provide empirical evidence for policymakers and relevant educational stakeholders to consider whether private tutoring should be valued in its current form, as well as what should be done to break down educational inequalities and such practices of teachers at public schools.

7 Conclusion

The results of this study further expand the understanding of student-, family-, and school-related effects on student achievement and discuss opportunities to enhance student learning in the Cambodian general education context. This study has important implications for policy and practice. Overall, the findings of the current study have supported that absenteeism negatively affects student learning outcomes, especially achievement. To keep students on track, schools might raise funds to provide scholarships and buy bicycles for students who live in poor households and far from the school. And, to ensure students come to schools regularly, parent-teacher cooperation is critical. Parent-teacher cooperation is the most efficient method to prevent and minimize absenteeism rates (Sem and Hem 2016). The guidelines instructing teachers on observing absentees should be properly followed by related agents at the school level.

Moreover, the positive effect of private tutoring on achievement has emphasized a crucial remark for Cambodia educational stakeholders. It is not surprising that students who are more involved in private-tutoring classes tend to perform better than other students, but the finding has highlighted this as an issue for the universalization of EFA and educational equality. This practice continues to stratify Cambodian students by their socioeconomic status in the public-school system and disadvantages a majority of students due to unequal access to the full curriculum.

Appendix

See Table 3.

Table 3 Estimated correlations between the variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|--------------------------|--------|--------|--------|-------|--------|-------|--------|--------|--------|-------|-------|--------|-------|------|------|
| 1. Achievement | 1.00 | | | | | | | | | | | | | | |
| 2. Gender | 0.07 | 1.00 | | | | | | | | | | | | | |
| 3. Age | -.12** | -.14** | 1.00 | | | | | | | | | | | | |
| 4. Disabilities | -.11* | -.03 | 0.01 | 1.00 | | | | | | | | | | | |
| 5. Late school entry | -.06 | -.03 | .44** | -.05 | 1.00 | | | | | | | | | | |
| 6. Repetition | -.05 | -.06 | .25** | -.02 | 0.01 | 1.00 | | | | | | | | | |
| 7. Absenteeism | -.15** | -.03 | 0.01 | -.02 | 0.00 | .111* | 1.00 | | | | | | | | |
| 8. Private tutoring | .12** | 0.01 | -.17** | 0.01 | -.12** | -.09* | -.14** | 1.00 | | | | | | | |
| 9. Number of siblings | -.07 | 0.01 | .19** | 0.05 | .16** | 0.08 | 0.06 | -.12** | 1.00 | | | | | | |
| 10. Mother education | 0.00 | -.06 | -.12** | 0.01 | -.06 | -.05 | -.05 | -.04 | -.15** | 1.00 | | | | | |
| 11. Father education | -.06 | -.18** | -.12** | 0.02 | -.06 | -.04 | -.02 | 0.01 | -.15** | .51** | 1.00 | | | | |
| 12. Socioeconomic status | 0.04 | -.10* | -.02 | -.10* | -.06 | 0.05 | -.08 | 0.07 | -.04 | .14** | .22** | 1.00 | | | |
| 13. Learning environment | -.02 | 0.03 | 0.01 | 0.06 | -.04 | 0.04 | .11* | -.04 | .10* | -.02 | 0.01 | -.12** | 1.00 | | |
| 14. Helpful teacher | .11* | 0.02 | -.02 | -.08 | -.05 | -.04 | 0.05 | .11* | 0.02 | -.03 | -.02 | -.05 | .27** | 1.00 | |
| 15. School distance | -.01 | 0.06 | 0.06 | 0.00 | 0.06 | 0.02 | 0.04 | -.11** | 0.02 | 0.01 | 0.01 | 0.02 | -.08 | -.01 | 1.00 |

* $p < 0.05$; ** $p < 0.01$

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