

# Determinants of Academic Performance of Pupils in Vietnam

Nguyen Thi Thuong<sup>1\*</sup>, Nguyen Thi Vi<sup>2</sup>, Le Thuy Linh<sup>3</sup>

<sup>1</sup>Faculty of Investment, National Economics University, Hanoi, Vietnam

<sup>2</sup>Faculty of Economics, National Economics University, Hanoi, Vietnam

<sup>3</sup>Faculty of Foreign Languages, National Economics University, Hanoi, Vietnam

\*Corresponding author: [thuongnt@neu.edu.vn](mailto:thuongnt@neu.edu.vn)

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**Abstract** This paper investigates determinants of academic performance of pupils in Vietnam by applying multivariable regression and Probit models on the Lower Secondary Education Development Project's dataset. It is found that the characteristics of pupils, their parents, school, and community are important factors affecting academic performance and the probability of getting the national education standard. Based on empirical results, recommendations are given to promote academic performance and enhancing the national education standard in Vietnam.

**Keywords:** *pupils, academic performance, education, national education standard*

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## 1. Introduction

Education is both an engine and objective of development. Recent literatures well document the importance of education on economic growth, poverty reduction, and equality. Education helps people fully participate on activities in a modern society and plays the key role in improving ability and capacity of a developing country to sustain its economic growth and development. With its dual roles, education is the heart of economic development [1]. In Vietnam, education is one of the sectors receiving the highest priorities of investment because of its key roles in eliminating poverty and sustaining economic development of the country. Many education-supporting policies such as universal education for children, attacking "achievement diseases", recent campaign "three NO", and education reform efforts are considered as breakthrough solutions to increase quality of education and eventually returns of education. Given a huge investment on education, understanding factors most efficiently improve the academic performance of pupils is essential for education reforms in Vietnam. In the literature, many indicators such as enrolment rate, literacy rate, drop-out rate, and academic performance have been used to measure educational development of a country. Of which, academic performance is considered as a good indicator and great concern to researchers and policymakers [2]. Improvement of school performance would be an important part of human capital development in all countries including Vietnam.

This paper is to empirically investigate determinants of academic performance and probability of getting the national education standard of grade-9 pupils in Vietnam. The grade 9 is chosen as the research subject because the completion of this grade of schooling impacts largely on an individual's future opportunities. In addition, universalization of secondary education in the whole country is one of the main objectives of education sector. On the other hand, academic performance of grade 9 helps to evaluate learning outcomes of pupils after their completion of primary and secondary schools. Therefore, the thesis is expected to provide some empirical findings and then propose some recommendations for policy makers in education sector to find some measures to improve the quality of Vietnam education. Using the national-scale survey carried out in 2016 by the Vietnam Institute of Educational Sciences, the paper finds that a number of pupils, household, school, and community characteristics are correlated with academic performance and probability of obtaining the national education standard.

In literature, academic performance of pupils has been well documented and related to many aspects of education such as the quality of schools, quality of teaching, gender of students, class sizes, and much more. Review of those studies has found that measurable and non-measurable outputs have similar importance but investing determinants and measuring their effects on academic performance is more preferable in such empirical work. Ridker (1997) found that there are five groups of factors affecting academic performance, including household characteristics, child characteristics, community characteristics, school characteristics, and other external characteristics [3]. Among

these groups, the first three directly determine academic performances while the others influence it indirectly.

Child characteristics significantly affect their academic performance. For example, in Egypt, children who spend more time working outside the household tend to fail completion of primary school and have lower levels of cognitive achievement [4]. A significant number of studies concluded that gender of a child affects their completion and performance at school. Girls were found to have lower rates of initial enrollment and completion than boys, but girls' performances at school were no worse than that of boys [5]. Thus, factors that reduce child labor participation would increase school participation as well as academic performances. The relationship between child's age and schooling attendance is negative and not simply linear in most of studies. In this relationship, the probability of going to school increases along with age and decreases with age square, suggesting an inverted U-shaped relationship [6].

Another significant component of literatures on schooling performance agreed that family characteristics played a role on determining academic achievements of pupils. The paper also revealed that mother's educational background affects children's schooling: the higher level of education of mother is the higher probability of children's cognitive achievement becomes [7]. Parents' education levels affect academic performance of pupils. This study found a positive correlation between father's and mother's years of schooling and their children's academic performances. The study showed that the effect of father's and mother's education on the probability of a daughter's academic performances is larger than of a son's, with an exception of the primary level. It also claimed that, in Turkey, per capita expenditure has a strong, positive effect on academic performances at all levels of schooling. This result implies that schooling is a normal good because when income increases, the demand for schooling will increase.

School characteristics have direct effects on pupils' academic performance. For example, classroom quality is more important than teachers in determining schooling achievement in Ghana [8], while in the Philippines, classroom furniture and workbooks provide the highest payoff in terms of academic performances in the first grade [9]. The limited evidence available so far shows that school inputs, such as learning materials and facilities, seem to matter more in developing countries than they do in the United States due to the low overall level of inputs. A high-quality school will increase student achievement and "speed" through primary school and therefore saving costs. Ridker (1997) had the similar conclusion that school quality variables, such as pupil-teacher ratio and the presence of libraries in schools affect educational outcomes [1]. However, those studies have a weakness since they only focused on impacts of the pupil-teacher ratio without considering the effects of other school quality factors such as quality and experience of teacher, school facilities, and so on.

Community characteristics also have correlations with children's academic performances. Community characteristics affect household background in general and child characteristics in particular. For example, cultural beliefs may undervalue girls' education, lowering the probability of girls' cognitive achievement, or Government subsidies for schools may increase school quality, and therefore

indirectly impact on academic performances. It is widely accepted in previous studies using school characteristics as proxy for community that presence, proximity, and quality of local schools should have positive effects on school participation and performance [10]

Few studies addressing academic performance and its determinants have been found in Vietnam. Behrman and Knowles (1999) revealed that the relationship between household income and child schooling in Vietnam is considerable [11]. However, in the Vietnam context, household income collected does not reflect actual income of the households because of extra-income. In addition, wealth also affects child schooling, so the indicator that should be used is household's expenditure or expenditure per household member. The gender is considered in studies of child schooling in Vietnam. There is a gap of enrollment rates between boys and girls and the study finds that the boys' enrollment rate is higher than that of girls. Pham (2002) has an insightful study to enrolment of lower secondary school using VLSS 92-93 and 97-98 in rural areas [12]. Results show that ethnic, parents' education, gender and schooling costs have strong impact on school attendance. This is, however, limited to the lower secondary in rural areas [13].

Many other studies focused on different aspects of schooling performance such as dropouts, and then proposed solutions to strengthen the education system in Vietnam including Government budget and other mobilizing resources for education. They show great attention to teaching issues in terms of teacher quality, equipments, textbooks, salaries, and other learning-teaching materials [13]. Similar to the previous papers, however, those studies do not address determinants of child's academic performance and education quality in Vietnam due to lack of necessary data.

## 2. Content

### 2.1. The Research Framework and Model

#### 2.1.1. The Research Framework

The research framework is illustrated in Figure 1, in which variables are divided into groups of pupil characteristics, family characteristics, school characteristics and community characteristics. They are main performances contribution to academic performances of pupils presented in the previous studies.

#### 2.1.2. The research Model

This paper is to investigate determinants and how they affect academic performance of pupils in Vietnam. To measure academic performances of pupils, scores of math, literature, and English language will be proxied as their performances. The paper will investigate determinants affecting academic performances of grade-9 pupils; thus, three empirical models will be estimated.

$$Y = \alpha + X\beta + F\gamma + S\phi + C\theta + u, \quad (1)$$

In which, dependent variable Y is academic performance of grade-9 pupils that is math, literature, and English language scores. X is a vector of pupil characteristics such

as gender, ethnic groups, passion in learning, time traveling to school, extra-learning, number of days lost, studying at home and region;  $F$  is a vector of family characteristics such as number of children, educational background of parents and household appliances including learning desk, computer and internet;  $S$  is a vector of school characteristics which include location of school, gender and ethnic of the principle, teacher characteristics such as gender, educational qualifications, teaching experience and school facility variables such as department of teaching tools, experiment department, library and health care department;  $C$  is a vector of community characteristics including supports from local and community for pupils;  $u$  is residual terms; and  $\alpha, \beta, \gamma, \phi,$  and  $\theta$  are vectors of parameters.

The second objective of this paper is to estimate effects of the determinants on probability of a pupil who would obtain the national education standard. The Probit model will be used to reach to the objective.

$$\begin{aligned}
 \text{Prob}(Y = 1 | X, F, S, C) \\
 = \Phi(\alpha + X\beta + F\gamma + S\phi + C\theta + u),
 \end{aligned}
 \tag{2}$$

In which,  $Y = 1$  if scores of pupils at least are 500 or the pupil obtains the national education standard, and  $Y = 0$  if scores of pupils is less than 500.  $\Phi$  is a probability density function of the standard normal. Other variables are defined as above.

The marginal effects should be calculated to measure effect of changes in independent variables or determinants on the probability of a pupil who would obtain the national education standard. The effects of determinants on probability are calculated via marginal effects.

$$\text{The marginal effect} = \frac{\partial \text{Prob}(Y = 1 | Z)}{\partial Z}$$

$$= \frac{\partial \Phi(\alpha + X\beta + F\gamma + S\phi + C\theta + u)}{\partial Y} \frac{\partial Y}{\partial Z}
 \tag{3}$$

In which  $Z = (X, F, S, C)$ .

## 2.2. Data and Methodology

### 2.2.1. Data

The data used in the paper comes from a national-scale survey conducted by VNIES in the Lower Secondary Education Development Project II (LSEDPII). This survey covers 1,447 secondary schools and 35,680 pupils of grade-9 in 63 provinces/cities. In each school, 25 grade-9 pupils (and totally 35,680 pupils) were surveyed. The 1,447 principals/vice principals of schools were also chosen to complete the surveys. In each school, eight teachers (3 mathematics, 3 literatures, and 2 English language teachers) were selected to complete teacher survey. The surveyed sample by regions is presented in Table 1.

Table 1. Scale of the surveyed sample by regions

Regions	Principals/vice principals	Teachers	Pupils
Red River Delta	316	3,380	7,798
Northeast	178	1,636	4,409
Northwest	47	422	1,164
North Central	238	2,898	5,881
South Central Coast	147	2,163	3,618
Central Highlands	86	1,164	2,101
Southeast	213	3,459	5,237
Mekong Delta	222	2,936	5,472
Total	1,447	18,058	35,680

Source: Consolidation based on VNIES' data - 2016

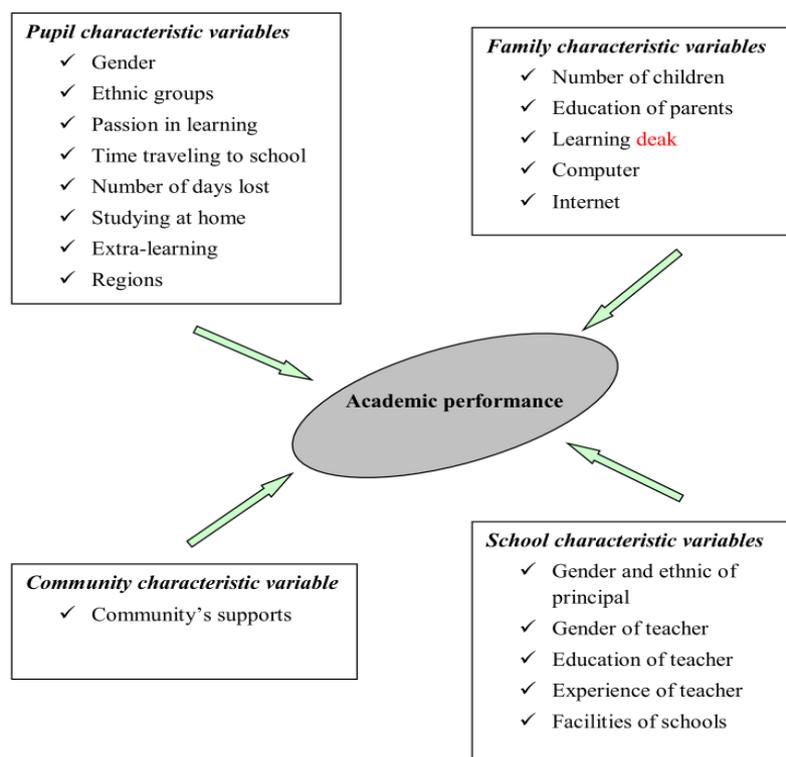


Figure 1. The research framework

Table 2. Definition of explanatory variables

Variables	Definition of variables
<b>Pupil characteristic variables</b>	
Region	= 1 if "Red River Delta", 2 if "Northeast", 3 if "Northwest", 4 if "North Central", 5 if "South Central Coast", 6 if "Central Highlands", 7 if "Southeast", 8 if "Mekong Delta"
Gender	= 0 if "female", 1 otherwise
Ethnic	= 0 if "Kinh ethnic", 1 if "other ethnic"
Passion in learning	= 0 if "no", 1 otherwise
Time traveling to school	= 0 if "less than 30 minutes", 1 if "30 minutes and more"
Number of days off school	= 0 if "6 days and fewer", 1 if "more than 6 days"
Studying at home	= 0 if "no", 1 otherwise
Extra-learning	= 0 if "no", 1 otherwise
<b>Family characteristic variables</b>	
Number of children	= 0 if "2 and fewer", 1 if "more than 2",
Career of mother	= 1 if "farmer", 2 if "worker", 3 if "teacher", 4 "police", 5 if "soldier", 6 if "staff", 7 if "trading"
Education of mother	= 0 if "lower than university", 1 if "university and post-graduate"
Career of father	= 1 if "farmer", 2 if "worker", 3 if "teacher", 4 "police", 5 if "soldier", 6 if "staff", 7 if "trading"
Educational of father	= 0 if "lower than university", 1 if "university and post-graduate"
Leaning desk	= 0 if "no", 1 otherwise
Computer	= 0 if "no", 1 otherwise
Internet	= 0 if "no", 1 otherwise
<b>School characteristic variables</b>	
Location of school	= 0 if "Urban", 1 if "rural", 2 if "remote"
Gender of Principal	= 0 if "female", 1 otherwise
Ethnic of Principal	= 0 if "Kinh ethnic", 1 if "other ethnic"
Ethnic of teacher	= 0 if "Kinh ethnic", 1 if "other ethnic"
Education of teacher	= 0 if "lower than university", 1 if "university and post-graduate"
Experience of teacher	= Years of teaching at the school to the surveyed time
Teaching tools	= 0 if "no", 1 otherwise
Experimental room	= 0 if "no", 1 otherwise
Library	= 0 if "no", 1 otherwise
Health care department	= 0 if "no", 1 otherwise
<b>Community characteristic variable</b>	
Supports of community	= 0 if "no", 1 otherwise

In order to reach to the objectives, many variables belonged to the four groups are investigated. Independent variables are summarized in Table 2.

### 2.2.2. Methodology

The thesis uses both descriptive and regression methods. A three-step analysis will be used. In the first step, the descriptive method will be used to measure academic performances in three core secondary curriculum subjects of grade 9, including Math, Vietnamese and English. In the next step, the multi-linear regression model will be used to investigate effects of each determinant on academic performances of pupils. In the last step, the thesis aims at exploring the effects of the determinants on probability of a pupil who would obtain the national education standard. The probit model will be used to reach to the objective. By using the three-step analysis, the thesis will provide more detail analysis on academic performances of pupils.

## 2.3. Estimation Results

### 2.3.1. Determinants of Pupils' Academic Performances

Estimation results on determinants of academic performance show that almost all explanatory variables are statistically significant at the conventional significant level. The results of multi-linear regression model for estimating of factors determining pupils' academic performances are showed in Table 3.

The estimation results show that *passion in learning* greatly influences to the pupil's academic performances of

English and Math. Pupils interested in Math and English have higher performances (4.1 and 2.2 points, respectively). Interest in learning of pupils also positively and modestly influences the test results of Vietnamese. Passion in learning has a positive effect on the test results of pupils in all three subjects, and the results are consistent with the previous descriptive analysis.

*Ethnic group* influences test results of all three subjects. Kinh pupils have higher academic performances of 2.6 points in Math and 3.1 points in Vietnamese than ethnic minority pupils. For English, however, ethnic composition of pupils did not statistically significant affect ability to learn English. In other words, ethnic indigenous and Kinh pupils are almost homogeneous in English performance in the schools.

*Gender of pupils* is also a significant factor affecting academic performances, especially scores of Vietnamese. Female have higher academic performances of 4.4 points than that of male in Vietnamese, 1.47 and 1.27 points in English and Math, respectively. Those results are in contrast to the initial hypothesis that boys have higher academic performances than girls because girls usually have to do housework and they have less time for studying. Reason supporting these empirical results is the relative prevalence of gender equality, even among ethnic groups, in education, work and social activities.

*Numbers of class absence* influence academic performances of pupils in a negative direction. Pupils with more than 6 absence days per year have lower academic performance of 3.3 points than those who fully attended Vietnamese classes; and for Math and English, the difference is 2.3 points and 1.0 points, respectively. There

are several reasons for pupils being off school. Firstly, some are too lazy to learn. For these pupils, it is necessary to have penalties to force them to go to school. This requires the collaboration between families and schools. Secondly, pupils have to work or do “helping jobs” such as baby sitting, housework and harvesting assistance. For these pupils, help of community and school is essential for them to continue schooling. Thirdly, the distance from home to school of pupils is so far that many pupils cannot attend school. For this case, it is necessary to expand the system of schools in all residential areas, especially mountainous areas to ensure that all children can normally access to school.

*Extra-learning* positively relates to academic performances. The greatest impact is on results of Math with the coefficient of 1.48, and it is only 0.39 and 0.92 points for Vietnamese and English, respectively. However, extra-learning has created some challenges on both pupils and their parents, so instead of pushing children to go to extra-learning classes, children should be encouraged to study themselves or to do homework under the guidance of adults which can ensure academic results.

*Educational background of parents* greatly affects test results of their children. Education level of mother affects children’s academic performances more largely than the education level of father. For example, pupils whose mothers have university degree or more have higher academic performance of 3.4 points in Math than that of pupils whose mothers do not. At the same time, pupils whose fathers have university degrees or more can get higher academic performance of 3.9 points in Math than that of pupils whose fathers do not. For Vietnamese subject, these points are 2.7 and 2.6, respectively. For English, these are 2.5 and 2.0 points, respectively. This result is as expected and consistent with previous findings. Intelligence is a genetic factor and therefore intellectual parents will produce smart kids. Moreover, parents with high levels of education will be aware of importance of education and invest more in education for their children and enjoy higher return of education.

*Number of children* in families negatively effects to the academic performances of pupils. The results show that pupils who live in families with two or fewer children have higher academic performances than pupils who live in families with more than two children. However, this effect is negligible. In all three subjects of Math, Vietnamese and English, the corresponding coefficients are -0.348, -0.269 and -0.282. This suggests that test results of pupils are not much influenced by the number of siblings in the family. In fact, despite living in large families who are in poor learning material conditions, many pupils still have very good test results thanks to the passion in learning, especially pupils in rural areas. Although the impact is not significant, household size negatively affects the learning outcomes of pupils. Therefore, the government should have policies to control population and birth rate, especially in rural areas and minority ethnics groups in order to create the best learning conditions for pupils, so they can achieve the best academic performances.

*Household appliances* such as learning desks and computers have positive effect on academic performances

of pupils. Families having learning desks for children, test results of their children will be 1.2 points in Math, 1.5 points in Vietnamese, and 0.8 points in English higher than those whose family does not have learning desks, respectively. Computers also have a large influence to the academic performances of pupils. Pupils who are equipped with computers would get higher Mathematic results of 2.6 points than those who are not equipped with computers. In Vietnamese and English, the differences are 1.8 and 2 points, respectively. In this era of information technology, *Internet* plays an increasingly important role in economic, politic and social lives. Internet is also expected to have positive impacts on academic performances of pupils because it helps pupils to get documents quickly and efficiently. However, estimated results are opposite for Math and Vietnamese subjects where *Internet* influences negatively on academic performances with the coefficients of -0.558 and -0.661, respectively. As for English, the internet has a positive impact on learning outcomes of pupils, but not significantly with the coefficient of 0.062. This result may imply that pupils would have misuse of internet (for example, instead of using internet to find learning materials, pupils use internet to play games online or visit black websites). It would be a concern of parents.

The academic performances of pupils are different by *regions*. Pupils living in Red River Delta have highest academic performance in Math and Vietnamese. However, it is unexpected that pupils in Mekong Delta have the lowest test results in all three subjects while pupils in Northeast, Northwest and even Central Highlands have relatively high academic performances, and pupils having the highest academic performances in English are from Northwest region.

*Gender of school principal* does matter to pupils’ academic performance. Pupils in schools with female principals have 0.4 points higher in Math, 0.6 points higher in Vietnamese and 0.3 points higher in English than those in schools with male principals. In addition, pupils in schools with “Kinh” principal have higher academic performances in all three subjects, Math, Vietnamese and English with the coefficients of 2.37, 2.31 and 0.54 respectively.

*Facilities of school* such as school supplies, laboratories, libraries and health-care facilities all positively have certain correlations with academic performances of pupils. Pupils in schools with better facilities have better academic performances than those with poorer facilities. Pupils in schools with department of teaching tools have higher scores by 0.6, 0.02 and 0.4 points in Math, Vietnamese and English respectively. The positive effects of laboratories, libraries and healthcare departments on academic performances of pupils are also found in this empirical work.

*Support of community* has a positive impact on academic performances of pupils. Those learning in the schools with support from community in education activities have higher academic performances than those in schools without local community support by 1.5, 0.4, and 0.3 points in Math, Vietnamese and English respectively. It is evidence showing the roles of the community support on improving the quality of education.

Table 3. Regression results for academic performances

Variables	Coefficients		
	Math	Vietnamese	English
<b>Pupil variables</b>			
Male pupils	-1.265***	-4.727***	-1.468***
Kinh group	2.576***	3.144***	0.166*
Passion in learning	4.132***	0.127**	2.161***
Number of absence days	-2.252***	-3.272***	-1.039***
Having extra-learning	1.484***	0.395***	0.924***
<b>Geographic Effects</b>			
Red River Delta	12.764***	10.620***	6.956***
Northeast	9.062***	7.687***	6.474***
Northwest	10.430***	6.557***	7.038***
North Central	7.173***	3.912***	3.593***
South Central Coast	7.963***	1.663***	4.402***
Central Highlands	6.585***	5.704***	3.387***
Southeast	1.630***	0.592***	1.617***
<b>Family variables</b>			
Education of mother	3.348***	2.699***	2.456***
Education of father	3.097***	2.623***	2.002***
Number of children	-0.348*	-0.269*	-0.282*
Having learning desk	1.223***	1.466***	0.756***
Having computer	2.626***	1.839***	1.962***
Accessing internet	-0.559***	-0.661***	0.062*
<b>School variables</b>			
Female principal	-0.404***	-0.561***	-0.435***
Kinh ethnic of principal	2.366***	2.309***	0.542***
<b>Facilities of school</b>			
Dep. Of teaching tools	0.626***		0.395***
Experiment rooms	0.425***	0.378***	0.403***
Library	0.691***	1.122***	0.962***
Health care department	0.703***	0.430***	0.672***
<b>Community variable</b>			
Community's supports	1.486***	0.426***	0.315***
Number of observations	32422	32422	32422

Source: Estimated based on VNIES' data – 2016

Note: \* is for 10%, \*\* for 5%, and \*\*\* 1% significance level.

Table 4. Marginal effects on probability of obtaining the national education standard

Variables	dy/dx		
	Math	Vietnamese	English
<b>Pupil variables</b>			
Male pupils	-0.041 ***	-0.174 ***	-0.071 ***
Kinh groups	0.087 ***	0.122 ***	0.037 ***
Passion in learning	0.158 ***	0.004 **	0.115 ***
Number of absence days	-0.093 ***	-0.122 ***	-0.075 ***
Having extra-learning	0.059 ***	0.014 ***	0.060 ***
<b>Geographic Effects</b>			
Red River Delta	0.424 ***	0.286 ***	0.330 ***
Northeast	0.306 ***	0.211 ***	0.316 ***
Northwest	0.329 ***	0.192 ***	0.334 ***
North Central	0.276 ***	0.139 ***	0.180 ***
South Central Coast	0.276 ***	0.069 ***	0.227 ***
Central Highlands	0.231 ***	0.177 ***	0.183 ***
Southeast	0.067 ***	0.011 *	0.082 ***
<b>Family variables</b>			
Education of mother	0.115 ***	0.111 ***	0.125 ***
Education of father	0.104 ***	0.087 ***	0.093 ***
Learning desk	0.038 ***	0.061 ***	0.051 ***
Computer	0.090 ***	0.071 ***	0.101 ***
Internet	-0.018 ***	-0.020 **	-0.004 ***
<b>School variables</b>			
Gender of principal	0.003	-0.018 *	-0.030 ***
Kinh principal	0.098 ***	0.073 *	0.058 ***
<b>Facilities of school</b>			
Dep. Of teaching tools	0.043 ***		0.014 *
Experiment department	0.007 *		0.021 ***
Library	0.024 ***	0.039 ***	0.058 ***
Health care department	0.034 ***	0.012 **	0.021 ***
<b>Community variable</b>			
Community's supports	0.072 ***	0.020 ***	0.025 ***
Observations	32422	32422	32422

Note: dy/dx is for discrete change of dummy variable from 0 to 1; \*\*\* is for 1% of significant level, \*\* for 5% and \* for 10%. This table does not show all marginal effects of all variables used in the empirical model.

### 2.3.2. Determinants of a Pupil Getting the National Education Standard

Another effort of this paper is to assess effects of determinants on probability of a pupil getting the national education standard, and a probit model is applied for this purpose. Table 4 presents marginal effects of determinants on probability for a pupil to obtain the national education standard.

Achieving the national standards is the target of pupils and pupils at all levels and grades of education in Vietnam, not only at grade 9. This study aims at finding out what factors most influence the probability of a pupil meeting the national education standard in order to draw the most viable recommendations for policy makers in the education sector. The regression estimation successfully finds out the factors which significantly affect the probability of a pupil who would obtain the national education standard in all the three subjects. Those factors include passion in learning, education background of parents, number of days lost, gender of principal, household appliances such as learning desk and computer, facilities of school such as library and health-care department, region, location of school and community's supports.

*Passion in learning* has a significant effect on the probability of meeting national education standard of pupils. The positive signs of this dummy variable in the three subjects indicate that pupils who are interested in learning have higher probability of gaining the national education standard, especially in Math and Vietnamese subjects. As shown in Table 4, if pupils are interested in learning, the probability that they can meet the national standard in Math and English is greater than others by 15.8% and 11.5% respectively.

*Education of parents* is another important variable, particularly education of mother. It is not surprised that education of parents is positively associated with probability of getting national standards in education of pupils. The estimated results in Table 4 shows that mother with university degree or higher, their children would have higher probability of meeting the national education standard than those whose mothers without university degree being 11.5%, 11.1% and 12.5% in Math, Vietnamese and English, respectively. In addition, pupils whose fathers have university or higher degrees have higher probability of achieving the national education standard than others by 10.3%, 8.7% and 9.3% in Math, Vietnamese and English, respectively.

*Number of school absence* has an expected effect on probability of getting to the national education standard. The estimated result shows that pupils with more than 6 school absence days have lower probability of getting the national education standard than those who fully attend classes by 12.2% in Vietnamese, 9.3% in Math and 7.5% in English. These results imply that school attendant is an important factor on determining academic performance and helping pupils to obtain the national education standard.

The probability of getting the national education standard of pupils is also determined by *gender of pupils*. Female pupils have higher probability of gaining the national education standard than male pupils. The highest difference in Vietnamese is 17.7%, in English is 7.1% while the lowest difference is in Math (4.1%). *Ethnic of*

*school principal* also has a significant positive relation with the probability of getting the national education standard of pupils in all three subjects. The positive signs on the gender of school principal indicate that pupils in schools with "Kinh" principals have higher probability of achieving the national education standard than those in schools where principals are of ethnic minorities. The highest disparity is in Math with 9.7%, followed by in Vietnamese with 7.3% and the lowest disparity is in English 5.8%.

Probability of getting the national education standard of pupils also depends on *household appliances* that a pupil has, such as computer and learning desk. Pupils who are equipped with computers get higher probability of obtaining the national education standard than others by 9%, 7.1% and 10.1% in Math, Vietnamese and English, respectively. Pupils equipped with learning desks also have higher probability of getting the national education standard than others by 4% in Math, 6.1% in Vietnamese and 5.1% in English.

*Facilities of school* such as library and health-care services have positive association with the probability of getting the national education standard of their pupils. As results in Table 4, pupils have higher probability of getting the national education standard when they study in better facilitated schools. Pupils in school with libraries have higher probability of getting the national education standard of 2.4%, 3.9% and 5.8% in Math, Vietnamese and English compared to those in unfurnished schools, respectively. In addition, pupils in schools with health-care services have higher probability of getting to the national education standard by 3.5% in Math, 1.2% in Vietnamese and 2.1% in English.

Probability that pupils achieve the national education standard varies across *regions*. Pupils in the Red River Delta have the highest probability of getting to the national education standard, and pupils in the Mekong Delta have the lowest probability of getting the national education standard. This is unexpected that pupils in the Central Highlands have relatively high probability of getting to the national education standard because most of pupils in the region are ethnic minority with low living and schooling conditions.

*Community's support* has positive relations with the probability of getting the national education standard of pupils. Socialization in education which has been implemented nationwide is to mobilize contributions of the whole community in terms of material, intellectual resources and manpower to develop education. With the local community's supports, pupils have better conditions of learning so their probability of getting the national education standard is expected to improve. The empirical results show that pupils with community's support have higher probability of gaining the national education standard than that of pupils without community's supports by 7.2%, 2% and 2.5% in Math, Vietnamese and English respectively.

## 2.4. Findings and Policy Recommendations

### 2.4.1. Main Findings

Based on the latest updated data sets of VNIES 2016, the study has obtained some useful findings in comparison to the previous literature in educational studies.

Firstly, it is found that a pupil's academic performances and probability of getting the national education standard are positively and strongly correlated with passion in learning. Pupils who are interested in learning have higher academic performances and probability of reaching the national education standard in secondary education.

Secondly, pupils' academic performances and probability of reaching the national education standard have a positive correlation with their parents' education. The estimation results show that there is a relatively significant difference between coefficients of mothers' and fathers' education. Which is in line with literature review of this thesis. Mothers' education has stronger association with their children's academic performances and probability of getting the national education standard than education of fathers. In a family, education of parents may reflect their viewpoint of education and intelligence is a genetic factor and therefore good parents will produce smart kids. Education of mothers could further reflect home investment and home care for children because mothers are usually closer with children than fathers. Regarding the role and capabilities of women, the estimation results shows that girls have higher academic performances and probability of getting the national education standard than boys. Pupils in schools with female principals have higher academic performances than those of pupils in schools with male principals.

Thirdly, pupils' academic performances and probability of getting the national education standard varies among regions as expected. In Mekong Delta region, however, pupils have the lowest academic performances and probability of getting the national education standard which is a surprising result. This is because rural people in delta regions have better living conditions compared to remote areas. One possible explanation for Mekong Delta region is that it is a relatively rich agricultural region where there are many good opportunities of agricultural jobs for children here. This leads to a relatively high opportunity cost of schooling and less time for schooling. Children are not much interested in learning and they are off school a lot, which makes their academic performances and probability of getting the national education standard low since interest in learning and days off school are found to have strong correlation on academic performances and probability of getting the national education standard of pupils.

Forthly, community's supports positively correlate with academic performances as well as probability of getting the national education standard, which is in line with expectations.

#### **2.4.2. Policy Recommendations**

Based on the empirical results presented in the section 4, some recommendations are proposed to improve academic performances and probability of getting the national education standard. The academic performance is one of important factors which decide education quality. However, other available studies of education in Vietnam often focus on "education quantity" such as schooling enrollment. To improve the education quality, government should consider academic performance as an important measurement.

It is necessary to introduce measures which can enhance the pupils' academic performances. Policy makers also need to develop and effectively implement poverty alleviation programs, especially in disadvantaged communes. These programs will help to improve socio-economic conditions of families, which are expected to largely affect academic achievement of pupils, particularly for those of ethnic minority groups.

Passion in learning of pupils is strongly and positively correlated to their academic performances. To promote pupils' interest in learning, there should be a combination between family and school. For the family, parents should create good conditions for their children to study. They also have incentives to generate interest in learning for children, and for the school, teachers need to apply various forms and teaching methods to encourage and attract participation of pupils in learning activities. Learning environment is also an important factor in passion in learning. Therefore, it is recommended to improve facilities and equipment as well as learning environment for pupils in order to bring them a comfortable and exciting environment for learning. It raises an actual need for policy makers, school managers, teachers, family, and pupils as well.

Education of parents plays an important role in their children's education. Therefore, it is necessary to produce measures to improve educational background and professional skills of parents, especially those in remote areas so that they can support their children's learning at home. Some possible measures may include compiling instructional materials for parents about their children's learning programs, organizing short-term training courses at the beginning of each semester or school year, closely cooperating between schools and communities to help pupils whose parents have low level of educational background, and universalizing knowledge in teaching children via mass media. It is also necessary to propagandize the importance of educated parents on their children academic performance.

Girls' academic performances are found to be higher than boys. It is necessary to produce policies of advocacy and support female school enrolment. In addition, policies supporting female principals in offices women in management should be applied.

Government should pay more attention to Mekong Delta region because this region has the lowest academic performance and probability of getting to the national education standard. To solve this problem, on one hand it is necessary to propagandize children and their parents being aware of the importance of education. On the other hand, the distance from home to school needs to be reduced by extending the school network to villages and improving transportation infrastructures to increase pupils' school attendance.

The community's supports are found to positively correlate with academic performances as well as the probability of getting the national education standard. Local communities should support schools and pupils such as allocation of essential school supplies for pupils in disadvantaged areas. This kind of activities is believed to increase academic performance and probability of getting the national education standard of the pupils.

### 3. Conclusion

In the past decades, Vietnam has made impressive progress in education, training and labour market. Economic reforms have created new opportunities and challenges for employees. People's income and education have significantly increased. Education and training play an increasingly important role in raising people's earnings. In contrast, labour market is creating more challenges for further education and training reforms. In order to meet the requirements of national socio-economic development, the quality of labour resources should be considered as the top priority.

Previous research on Vietnam's education have been found to focus mainly on quantitative issues such as schooling probability and enrolment rates, due to lack of appropriate methodology as well as good data. This thesis focuses on examining determinants of the grade 9 pupils' academic performances in the whole country. In addition, the thesis presents how the determinants correlate the probability of a pupil getting the national education standard. Certain recommendations for policy implementation have been proposed basing on the estimation results of the thesis, with a hope to contribute to the development of education in Vietnam on both terms of quantity and quality.

By using the most updated data sets of VNIES 2016, this thesis has successfully conducted estimations with statistically significant findings which can satisfactorily answer the initially proposed research questions and imply meaningful policy recommendations. Firstly, the estimated results confirm that passion in learning largely correlates with pupils' academic performances and probability of getting the national education standard, which is in line with the theoretical and assumptive background that "passion in learning" could improve pupils' academic performances and then enhance the quality of human resources. Secondly, education of parents, especially education of mother is shown, as expected, to have a positive correlation with their children's academic performances. Parents with high educational levels (university and post-graduate) can push their children's academic performances. Thirdly, pupils' academic performances and probability of getting the national education standard varies over different regions as expected. Children in Mekong Delta region have the lowest academic performances. Fourthly, pupils' academic performances and the probability of getting the national education standard are found to positively correlate with community's supports as initially expected.

Basing on the above empirical findings and subject to the intuitive limitations of the data sets used for estimation, the results express some policy implications for the policy-makers' consideration. With the target to improve the quality of education in all levels, the government should build more strategic focus on the poor and those living in disadvantaged regions, including rural areas, remote areas and ethnic minority groups. The efficient coordination between governmental agencies including MoET, DoETs, schools and families is very much required to promote the passion in learning of pupils. The community's supports also play an important role in improving the academic performances of pupils in particular and the quality of the educational sector in general.

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