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Limited opportunities: research on poverty factors that implicitly affect higher education access and consequently expected income for Ecuadorian baccalaureate graduates.

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RESUMEN

El presenta trabajo busca analizar la influencia de la educación como una actividad económica mediadora para la creación de oportunidades que permitan movilidad socioeconómica igualitaria para toda la población. Ecuador se usa como caso de estudio para ver la participación de factores asociados e influenciados por el ingreso familiar en el aprovechamiento educacional de los estudiantes. Se usa la metodología de análisis por mediación de datos, donde la variable independiente son los factores de pobreza y la variable dependiente es el ingreso esperado de 12 profesiones separadas en tres grupos de acuerdo con el nivel de ingreso promedio (alto, medio y bajo). En este sentido, la variable de mediación es la nota obtenida en el examen Ser Bachiller. Se hace un control solo para estudiantes de instituciones educativas públicas, y se trata de controlar el estudio solo para individuos asignados a instituciones educativas de nivel superior de tipo públicas. Se encuentras correlaciones con alta significancia estadística que sugieren incentivos suficientes para ampliar este enfoque de investigación, para así redefinir la manera en la que se aborda la pobreza y la manera de mitigarla. Puesto a que el ingreso percibido por la familia no viene en medición continua, se hace una comparación por quintil. En la misma se ven resultados más altos a medida que el ingreso esperado es mayor, y la diferencia en coeficientes entre el quintil 1 y 5 es preocupante. Este estudio no demuestra causalidad entre las variables, pero ciertamente es suficientemente impactante como para motivar iniciativas que busquen entender cómo la pobreza es un mediador de oportunidades limitadas en la educación. Así conduciendo a una inherente problemática de movilidad social.

Palabras clave: *Reproducción social, movilidad socioeconómica, pobreza, educación, oportunidades limitadas, logro académico, capacidades estudiantiles.*

ABSTRACT

The present study aims to analyze the influence of education as a mediating economic activity for the creation of opportunities that enable equal socioeconomic mobility for the entire population. Ecuador is used as a case study to examine the participation of factors associated with and influenced by family income in students' educational achievement. The data mediation analysis methodology is employed, with the independent variable being poverty factors and the dependent variable being the expected income of 12 professions categorized into three groups based on average income levels (high, medium, and low). In this regard, the mediating variable is the score obtained in the Ser Bachiller exam. Control is applied only for students in public educational institutions, and the study focuses solely on individuals assigned to public higher-level educational institutions. Correlations with high statistical significance are found, suggesting sufficient incentives to expand this research approach in order to redefine how poverty is addressed and mitigated. Since family income is not measured on a continuous scale, a comparison by quintiles is made. The results show higher outcomes as the expected income increases, and the coefficient differences between quintiles 1 and 5 are concerning. This study does not establish causality between the variables, but it is certainly impactful enough to motivate initiatives seeking to understand how poverty acts as a mediator of limited opportunities in education, leading to an inherent issue of social mobility.

Key words: *Social reproduction, socioeconomic mobility, poverty, education, limited opportunities, academic achievement, student capabilities*

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INTRODUCTION

Education is commonly seen as a path to achieve social mobility and economic success. However, in Ecuador, a significant part of the population is in a disadvantaged situation in terms of their educational and (consequently) work opportunities, which, is a result of various economic and cultural conditions. Banerjee and Duflo (2011), in their book "Poor Economics", address the issue of education and its positive correlation with poverty, but beyond that, they highlight how implicit social factors play a key role in making education investment effective. In this sense, there have been significant contributions to the literature through investigations of different factors such as nutrition (see Quijije Logroño, 2019; Ghosh, 2013; Anuar, Lim, Low, and Harun, 2005), family environment (see Mimrot, 2016; Daulta, 2008), social factors (see Chetty, Hendren, and Katz, 2016; Haffernan, 2020; Mahemood and Taswir, 2013), among others. Under these ideas, this research seeks to contribute to the existing literature from the perspective of a study of a more homogeneous population in terms of educational quality, in order to isolate the effect of implicit socioeconomic factors in the educational processes. For these considerations, Ecuador is a perfect case study due to the educational centralization process that the country underwent in the period 2008-2013 under the mandates of President Rafael Correa.

In this sense, the following question arises: Does Ecuadorian students perceive the effects of social reproduction through education because of their socioeconomical status? How does the role of family conditions and lack of resources inform students' performance in the Ser Bachiller exam, and how this is related to their expected income once they grow up? The study focuses solely on students that graduated from a public high school and are entering public-funded higher education institutions in Ecuador. Until 2019, the entrance exam for higher studies was called Ser Bachiller, which measured students' aptitude in numerical, logical, abstract, and verbal reasoning

(Redacción Comercial, 2022). As part of the requirements for taking this exam, a prior questionnaire of associated factors ("Encuesta de Factores Asociados" EFA) is administered, from which information related to the students' profiles and living conditions is obtained [Annex 1].

With the use of multiple databases (with the most recent data available) provided by Ecuadorian Institute of Higher Studies (Senescyt), Ecuadorian Institute of Social Security (IESS) and Ecuadorian Institute of Education Evaluations (Ineval), econometric tools are employed to statistically analyze the existence or absence of an effect of two types of poverty related factors on students' academic achievement. These students are guided by the same curriculum and take the same final evaluation. It should be noted that a demographic breakdown is used to analyze whether any effect is perceived in different population groups (gender, area of residence, and ethnicity). As previously mentioned, students' scores on this exam determine the institutions of higher education that they might enter and place a priority status for obtaining a spot in the career of their choice (see [Annex 2]). Therefore, for a group of people who cannot easily access private higher studies, this exam is crucial for their professional development and strongly correlates their early life living conditions with their mid-term salary aspirations. Thus, it becomes a topic of great interest for educational economics and further develops Banerjee and Duflo's suggestions on these understudied aspects for the creation of policies to mitigate poverty.

The hypothesis is that there will be a statistical significance in the correlation between family and material conditions and the academic achievement of the students, which will be evidenced through their performance in the Ser Bachiller exam. It is presumed that the poverty associated factors that will showcase a larger gap between students are the lack of basic needs and material comforts. Additionally, it is expected that there is a parallelism between income and the minimum grade necessary to access certain careers in higher education public institutions.

Consequentially, there is supposed to be a statistical correlation between the early life living conditions and the expected incomes of students that were part of the public education system.

The obtained results evidence the close relationship between income quintile and the scored grades in the Ser Bachiller exam. When analyzing family and material conditions, they also show interesting results, but beyond being informative they are used as control variables to conjecture the correlation linking expected average income and childhood living conditions. The study is limited because of multiple reasons, but the findings are intended to raise interest in the research regarding these implicit factors. The results are not meant to show any causality, but they do showcase an ongoing problematic in Ecuador, that many authors suggest that also happens on a lot of places around the world. Moreover, the study of related aspects that constantly but discreetly influence education, remain to be overlooked. The hopes are placed in rising the interest of understand they main causes of social reproduction that lead to increasing inequality gaps, due to an unsolved problem of multidimensional poverty.

LITERATURE REVIEW

After the contributions made by Karl Marx to economic thought, the influence of Marxist thinking has been seen in various areas, one of the main ones being education. In this sense, Paulo Freire (1968) was one of the greatest contributors to the interest in exploring and understanding economic disadvantages and their influence on education as mediators towards what he calls social reproduction. This is the main motivating factor for this research, and it is important to understand what it means. Social reproduction in the educational field explores the participation of traditional educational systems as perpetuators of social hierarchies and consequently of economic inequities (Freire, 1928). Therefore, this can be perceived as one of the pillars of the poverty cycle and inhibitors of individual mobility towards better social situations. Additionally, education is commonly cited as one of the fundamental factors in breaking the poverty cycle. Studies by Oreopoulos (2013) and Chetty, Hendren, and Katz (2016) demonstrate that education and the implicit factors involved in it are strongly and positively correlated with the expected level of income and employment of individuals once they enter the workforce. Marmot and Bell (2012) contribute to these considerations with a perspective towards inequality in access to health services, which stems from social determinants such as the level of education achieved and comparable education quality. As such, both the causes and consequences of an inefficient educational system that promotes social reproduction have detrimental effects on the economy in the long term and create social dissatisfaction for individuals who are negatively affected by it.

The economic disadvantages in relation to education not only imply limitations in terms of accessible quality, but also imply implicit considerations of individual lifestyle, which ends up influencing the relationship between the student and the educational process. Going deeper into

this topic is Considine's study (2002), which offers a perspective on the relationship between social and economic disadvantage and academic performance. The study, carried out in Australia, highlights the impact of factors such as low family income, parents' education, and their employment on academic achievement. The study found that students from low-income households had lower academic performance than students from high-income households. In addition, students whose parents had lower levels of education and were unemployed were also more likely to have lower academic performance. These findings highlight the impact of socioeconomic factors on academic performance and the need for specific interventions to address these disparities.

Additionally, there is Bittencourt's contribution (2020), which allows us to understand how the same teaching methodology does not achieve the same results in students from different social groups. Taking two schools from different economic levels in Ecuador, Bittencourt highlights the academic experience of students from both groups with the International Baccalaureate program (implemented by one of the former presidents of Ecuador in some public schools in the country in question). His findings allow us to understand that students with fewer school resources have greater difficulty efficiently completing the tasks proposed by this program. The author suggests that the main causes of this may come from the fact that the preparation of private schools is initially focused on the development of skills that will facilitate the understanding of this type of work and exams in the future. He also considers the size and conditions of the classrooms that do not facilitate group work, the social conditioning to follow orders rather than seek solutions, which is so characteristic of traditional education, and the difficulties in accessing materials to improve their educational process. Beyond that, there are notions of the differences between educational systems focused on leadership roles, teamwork,

problem-solving, among others, and educational systems that are managed under an "information bank" structure, where students are only recipients of information and do not develop other skills that allow them to emerge from a false awareness of human capital factors (Freire, 1968). In this sense, it is confirmed that the quality of education alone does not determine the possibilities for student growth, but that other factors such as family conditions, number of students per class, nutrition, and others, influence academic achievement.

Further developing this last theme of human capital, it is interesting to highlight how societies in recent centuries have used education as a means to disseminate necessary knowledge to maintain the social structure and restrict social mobility. The accumulation of human capital through education can become the means by which productivity and innovation are increased, thus fostering the economic growth and development of nations that will compete in this field to maintain their industrial processes in the forefront (Becker, 1993). In any case, for the social structure to function, there must be people who, through the education system, are directed to do minor jobs in the future. It is not difficult to perceive this, since the better-paid jobs are usually held by those with better education, and it continues to escalate downward to see the social reproduction system again. Markova et al. (2018) in Russia, compile and interpret the data corresponding to lifestyle, education, human capital, and social reproduction. They find that education is one of the determinants of human capital and therefore of people's lifestyle, with those from the wealthiest districts being the main beneficiaries of this system, as it positions them with social advantages in terms of work networks to maintain their status of power. Therefore, it is important to take into consideration research related to structural inequities in education.

Regarding structural considerations, the work of Reardon and Portilla (2016) stands out, which is in synergy with the research by Losen et al. (2015). They found that students from low-income households are more likely to start their education in schools with less capital, have less experienced teachers in educational sciences, and do not have access to academic disciplines beyond the traditional curriculum. Consequently, their future opportunities are compromised, as they tend to perform worse than their peers from better academic institutions. Similarly, this effect is most noticeable among ethnic or racial minority groups, whose students perceive injustices in the educational system, such as higher rates of expulsions or suspensions. Regarding inequity across social structures, Chile and Finland can be contrasted, taking into account the contributions of Figilo, Hart, and Karbownik (2021), Joiko (2011), and Feleaga (2014). It can be seen that one of the detrimental effects of the privatization of the educational system is that it exacerbates the problems of inequity among different social groups, as the accessible opportunities from educational institutional advantages become more marked. In this sense, a country like Chile has a high level of inequality, while Finland has very low levels of inequality by adhering to a system that promotes free education through its centralization. In fact, not paying for education seems to have created one of the best education systems in the world, where economic capacity or context does not present barriers to students due to the homogenization of the system, where only implicit factors such as family influence and nutrition need to be solved.

Finally, standardized tests and the challenges faced by economically disadvantaged students regarding them should be mentioned. Koretz (2017) mentions in his work that students from low economic backgrounds have more learning difficulties and may not have access to certain advantages such as tutors, which makes standardized tests the center of much criticism

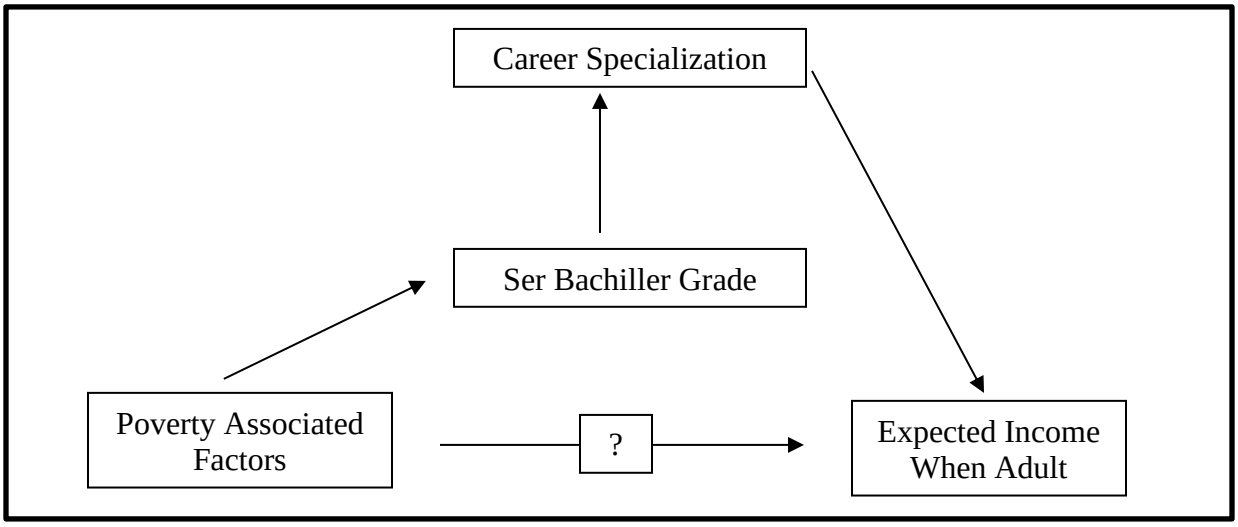
for perpetuating inequity through evaluations that favor those who have more resources at their disposal. It is worth noting that standardized tests continue to be the main method of evaluation to designate university or higher academic opportunities worldwide. Bourdieu (1984) emphasizes that the barriers imposed by purchasing parity pose great disadvantages for those in vulnerable social groups, as they do not have equitable access to technology or textbooks that facilitate their learning process. Beyond this, students from difficult contexts perceive much more demanding daily routines that inhibit them from dedicating enough time to their studies. In general, economic disadvantages not only limit access to extra tools but sometimes also restrict a student's needs, resulting in worse academic achievements.

Research considering the low-average social context, as is the case for most of the population in developing countries, has been carried out mainly in Latin American countries. However, research aims to demonstrate the problem of inequality through socioeconomically very different groups, thus challenging the reality that the complete deprivatization of education is still utopian, as governments can hardly meet all the demand for this service alone. It remains to understand in-depth the fundamental characteristics of this social mobility problem that arise from implicit factors in education. Significant findings have been made regarding the influence of nutrition on learning ability, resulting in a positive correlation (Santos and Barros, 2022), but it is not sufficient to explain all the educational disadvantages that poverty-stricken students suffer compared to their peers. This effect is not limited to districts or states but can also be perceived within the same courses where the quality of education is exactly the same, and the variant becomes these hidden factors.

METHODOLOGY

This investigation required three databases for analyzing the effects of education on predicted salary for 2019 baccalaureates. The objective is to facilitate the interpretations of results in order to answer the main question regarding social reproduction and social mobility. Given that there is not a database that has all the information required, the methodology of *Mediation Analysis* (MA) was applied to acquire the necessary statistical data. MA is a statistical type of analysis that allows empirical interpretation of the correlation between two variables that cannot be solely regressed, due to different reasons. According to the University of Virginia Library (2016), MA takes a third variable (M) into account to obtain empirical evidence of the effect of a variable X in a variable Y. Due to the necessity of using 3 databases, MA provides a solid alternative to use the application notes and the assigned specialization relationship to mediate in the analysis of the effects of early life living conditions on the expected income when adults. These images will help to illustrate more the proposed methodology in this specific case of study:

Graph 1. Mediation analysis method



Source: Self made

The “Ser Bachiller” grade works as a mediator since it is a common variable in both Ministry of Education and Senescyt, databases. Additionally, “Career specialization” is the main mediator variable to explain “Poverty associated factors” and “Expected income when adult” correlation in three simple steps:

1. The first regression uses the Ineval’s database and outcomes statistical description of the poverty associated factors that are related to the scored grade. These factors are specific for family conditions and lack of basic resources. With the results it is intended to analyze the effects through a simple ordinary least squares (OLS) regression between grades and income quintile controlled by living conditions variables. Additionally, box graphs will be presented to illustrate the positional grade area distribution for each response used in regression (1.4).
2. The second part relays on analyzing the relation between income and the minimum grade to enter a career. To do so, the IESS’ (Enemdu) and the Senescyt’s databases were used simultaneously.
    i. Use Enemdu to identify the average income that people who graduated and obtained the title of certain career report. A total of 12 were selected and divided into three categories according to the perceived income (high, medium, low).
    ii. Use Senescyt to identify a proxy, of the minimum requirement to be assigned to a specialization, by using the lowest grade that was assigned to each of the 12 careers.
3. To conclude the MA, the obtained grade cuts are meant to be used to analyze how poverty conditions affect the probability of achieving those. To do so, a probability

regression (*probit*) is useful to observe how the people, under poverty controls, in each quintile perceive differences in their career opportunities.

The regressions methodology for addressing this study is based on the approaches from the book "Applied Econometrics" (Asteriou & Hall, 2006). It is important to take into consideration that the EFA questionnaire is limited to showing data based on the student's perspective, and thus it may be subject of exaggeration of reality or lies since it does not have administrative backup. Even though, the final database (cleansed) eliminates anomalies in data such as contradictory responses or missing values. Moreover, for the purpose of this investigation, only students who graduated from public-funded high-schools are taken into consideration. With that in mind, the simple OLS regressions are constructed by the following formulas:

The first simple OLS regression only takes into consideration the evaluation's grade (continuous), the hours of study and the quintile (categorical) that the student who obtained it self-reported. See [Annex 3] to see the questionnaire's questions translated to English.

$$\widehat{grade} = \widehat{\beta_0} + \widehat{\beta_1} hrstudy + \widehat{\beta_2} quintile + \widehat{e_i} \quad (1.1)$$

Then two separated OLS regressions are made to identify the magnitude effects of each poverty associated condition in each group. Separation is necessary to avoid collinearity.

$$\widehat{grade} = \widehat{\beta_0} + \widehat{\beta_1} hrstudy + \widehat{\beta_2} hstab + \widehat{\beta_3} prtlinvlv + \widehat{\beta_4} edulvlm + \widehat{\beta_5} edulvlf + \widehat{\beta_6} ocupm + \widehat{\beta_7} ocupf + \widehat{e_i} \quad (1.2)$$

For:

hstab = home stability in terms of happiness

prtlinvlv = parental involvement in educational matters

edulvm = educational level achieved by the mother

edulvlf = educational level achieved by the father

ocupm = employment situation of the mother

ocupf = employment situation of the father

$$\widehat{grade} = \widehat{\beta_0} + \widehat{\beta_1}hrstudy + \widehat{\beta_2}hunger + \widehat{\beta_3}home + \widehat{\beta_4}light + \widehat{\beta_5}water + \quad (1.3)$$

$$\widehat{\beta_6}sanitary + \widehat{\beta_7}trash + \widehat{\beta_8}room + \widehat{\beta_9}desk + \widehat{\beta_{10}}pc + \widehat{\beta_{11}}laptop +$$

$$\widehat{\beta_{12}}internet + \widehat{\beta_{13}}electronics + \widehat{\beta_{14}}work + \widehat{\beta_{15}}schoolhr + \widehat{e_\iota}$$

For:

work = the student works for money

hunger = has the student suffered hunger due to insufficient food in the last 15 days?

home = bad or good constructions materials were used to build the house (shelter)

electricity = the house has electricity

water = the house has a potable water system

sanitary = the house has sewerage

trash = a trash truck takes wastes

bedroom = the student has his own bedroom

desk = the student has a desk to study

pc = the student has a desk computer

laptop = the student has his own laptop

internet = the house has internet access

electronics = the student uses electronic devices to study

schoolhr = how much time it takes for the student to arrive to school

Also, it is important to consider that *grade* is a continuous variable that goes from 400 to 1000 and therefore a *tobit* regression for a standardized grade is necessary to assure that there are no important deviations due to the data distributed in the lower limit.

The last OLS regression intends to analyze the effect of associated income quintile with the obtained grade in the exam, but this time controlled for all the poverty factors that do not suppose collinearity between them. It is important to take into consideration that a dummy is made for the parents' employment situation and educational level achieved; where it takes a value of 1 if anyone of them is employed or 0 if none is and 1 is completed school or 0 if not. Moreover, home stability was excluded due to collinearity and trash collection due to few observations. Finally, 'hunger' is modified to outcome 0 if the student has not suffered and 1 if yes.

$$\widehat{grade} = \widehat{\beta_0} + \widehat{\beta_1} hrstudy + \widehat{\beta_2} quintile + \widehat{\beta_3} work + \widehat{\beta_4} prtlinvlv + \widehat{\beta_5} peduclvl + \widehat{\beta_6} employement + \widehat{\beta_7} hunger + \widehat{\beta_8} home + \widehat{\beta_9} light + \widehat{\beta_{10}} water + \widehat{\beta_{11}} sanitary + \widehat{\beta_{12}} desk + \widehat{\beta_{13}} pc + \widehat{\beta_{14}} laptop + \widehat{\beta_{15}} internet + \widehat{\beta_{16}} electronics + \widehat{e_i} \quad (1.4)$$

For:

The ones already described will not be repeated.

employment = at least one of the parents of the student is employed

peduclvl = parent's educational level

Until this point the intention has been to analyze the influence of certain poverty conditions that may be informing grade. The nature of this study makes these results statistical and not causal. Therefore, the results will not be described as an effect but as an average outcome. The hypothesis is that there will be a positive correlation between better living conditions and grades in the Ser Bachiller exam. Thus, the first stage of the mediation analysis shall be complete.

The final part of the MA is to see if poverty conditions in early life stages somehow report lower expected income when adult, and to do so the career specialization will be used as a mediating variable. As established before, the steps for this section consist in finding the average income and the minimum grade associated to each career. The methodology for this will be to identify the average income of each person that reported obtaining a degree title, by employing Enemdu's database, being the most recent one the 2015. Once this is done, the next thing to do would be to sort the list in descending order and choose the outcomes that have enough observations to be a representative media. A total of 12 specializations will be chosen according to their positional ranking (top, mid and bottom). Thus, they should give a partial but significant panoramic of the relation between grades and income.

Using Senescyt's database, it will be possible to identify the lowest grade obtained by the student assigned to certain career. For that reason, it is important to emphasize that every graduated student can postulate to the specialization and university that they wish, but the system has the final call in which one they are assigned (Senescyt, 2023). That being the case, the database that is being used takes into account only the students that accepted their assignation and hence will study that career. Consequentially, a descriptive table will be built using the two values as well as a graph to illustrate better any linear relation.

RESULTS

Basic model

The first OLS regression intends to demonstrate that there is a correlation between grades in the Ser Bachiller exam and the income quintile to which each student belongs. In this sense, the daily hours dedicated to study will exhibit that there is a positive correlation between them and the score they get. Thus, the exam itself is measuring student's academic achievement. The first table shows the income statistical variation of grades in contrast with the variation that comes from each level of studying hours.

Table 1. Grade reported by income quintile

Variables	Grade report	SE
Constant	616.5	(2.530)
Daily study hours		
1 hour or less	9.494	(2.563)
1 to 2 hours	29.38	(2.536)
3 hours	52.89	(2.553)
4 hours or more	58.5	(2.552)
Income quintile		
Quintile 2	11.71	(0.550)
Quintile 3	21.72	(0.568)
Quintile 4	30.6	(0.586)
Quintile 5	49.48	(0.640)
Observations	214,581	
R^2	0.076	

Notes: SE (standard errors). The quintile is controlled for hours of study to showcase that students who study more report better grades and that effect is also perceived when regressed by income. Base categories set on baselevel 1 for both.
Source: Author's regression using Ineval's database

The base level used for *daily study hours* is '0 hours' and for *income quintile* is 'Quintile 1'. Therefore, Table 1 shows a positive correlation between both variables with all the coefficients being statistically significant to 1% ($p > |2.576|$). The evolution of both categorical variables is ascendant and in the case of daily study hours there is marginal growth except for the las category where there is still growth but a decrease in marginal output. On the other hand, the grade increases for each income quintile when compared to the first one, but with a decrease in the marginal output of approximately one point in each categorical progression. Nevertheless, it is astonishing to see that the 5th income quintile reports on average 50 points more than the 1st quintile. Considering that the obtained grades go from 400 to 1000, this result may be a representative difference when it comes to career postulation. Even though, it may be overestimated since it is not controlled for other things that affect education. Because of the purpose of this research and due to technological limitations, it will not be possible to include all the available variables; hence, only the ones that implicitly affect education will be included. Given that hours of study should have equal benefits independently from socioeconomical status, it will also be used as control and as an indicator that after including all the control variables its coefficients should remain relatively near to the values shown on Table 1.

Extending the base model

Thera are four regressions that were used for Table 2. The first one is the same as the one shown in Table 1, and because of the initial findings it was of interest to find the effect of family and material conditions that are strongly related to socioeconomical status. In this sense, the poorest quintiles should have worst conditions, which are presumed to have a direct influence on the students' academic achievement. Simultaneously, Table A1 shows a comparison between different demographic groups. First, it is interesting to see differences between rural and urban

Table 2. Grade reported by income quintile, family and material associated conditions

Variables	Grade by income quintile	SE	Grade by family conditions	SE	Grade by material conditions	SE	Grade by income with controls	SE
	(1)		(2)		(3)		(4)	
Daily study hours								
1 hour or less	9.494	(2.563)	18.82	(4.642)	4.618	(5.764)	9.514	(10.86)
1 to 2 hours	29.38	(2.536)	40.03	(4.605)	19.92	(5.715)	29.3	(10.78)
3 hours	52.89	(2.553)	62	(4.627)	42.32	(5.749)	49.05	(10.83)
4 hours or more	58.5	(2.552)	68.38	(4.626)	47.75	(5.747)	58.73	(10.83)
Income quintile								
Quintile 2	11.71	(0.550)					0.930	(2.968)
Quintile 3	21.72	(0.568)					2.349	(3.181)
Quintile 4	30.6	(0.586)					7.148	(3.353)
Quintile 5	49.48	(0.640)					15.51	(3.684)
Observations	214,581						15,078	
R^2	0.076						0.161	
Family Associated Conditions								
Home stability			6.235	(1.083)				
Parental involvement in education			-16.73	(0.616)				
Mother's educational level achieved								
1º EGB (kindergarten)			-1.756	(2.372)				
2º - 7º EGB (primary school)			3.068	(1.654)				
8º - 10º EGB (high school)			3.828	(1.844)				
1º - 3º BGU (baccalaureate)			14.62	(1.752)				
Technology general degree			29.77	(2.792)				
Degree			41.61	(2.165)				
Specialization			14.74	(3.297)				
Master’s degree			35.17	(4.016)				
Doctorate or PhD			-14.49	(12.69)				
Father's educational level achieved								
1º EGB (kindergarten)			7.284	(2.416)				
2º - 7º EGB (primary school)			13.11	(1.729)				
8º - 10º EGB (high school)			11.56	(1.942)				
1º - 3º BGU (baccalaureate)			23.63	(1.822)				
Technology general degree			36.12	(2.607)				
Degree			44.25	(2.247)				
Specialization			27.14	(3.469)				
Master’s degree			51.05	(4.197)				
Doctorate or PhD			34.36	(9.393)				

Mother's employment situation				
Home employed (unpaid)	18.61	(1.449)		
Employed (unpaid)	17.83	(2.523)		
Underemployed	21.9	(1.592)		
Only studies	-11.06	(5.685)		
Employed	29.19	(1.575)		
Father's employment situation				
Home employed (unpaid)	-0.576	(2.112)		
Employed (unpaid)	8.972	(1.939)		
Underemployed	7.025	(1.505)		
Only studies	-11.68	(10.16)		
Employed	10.9	(1.524)		
Observations	83,496			
R^2	0.104			
Material Associated Conditions				
Basic services				
Works for money			-24.91	(0.911)
Suffered hunger			-1.563	(0.945)
House materials (shelter)			3.716	(1.166)
Electricity			20	(3.196)
Water			3.038	(1.370)
Sanitary			17.1	(0.980)
Trash collection			-8.156	(1.295)
Material comforts				
Own bedroom			-6.784	(0.911)
Studying desk			12.42	(0.906)
PC			10.38	(0.900)
Laptop			18.05	(0.879)
Internet			14.23	(1.213)
Uses electronic devices to study			20.92	(1.700)
Arrival time (school)				
Between 15 and 30 minutes			3.523	(0.937)
Between 31 minutes and an hour			8.002	(1.159)
More than an hour			4.723	(1.892)
Observations			47,049	
R^2			0.123	

Notes: SE (standard error). See *Methodology* section (equations 1.1 - 1.3) for variable description. All variables are binary except for the ones that represent a level (income quintile, parent's education, and employment situation) or hours, which are categorical with base levels being the first one (thus, they show evolutive behavior). EGB stands for General Basic Education and BGU for General Baccalaureate Education. All binary variables take value of 1 for "Yes" and 0 for "No" responses. Regression (4) has all income associated variables as control variables, but some changes were made (see *Methodology* equation 1.4).
Source: Author's regressions using Ineval's database

areas of residence, since poor living conditions may have a stronger effect on students from rural areas enacting the education curriculum. Second, gender and ethnicity statistical comparison is not enough to conclude causal effects in any group, but it's statistically significant differences may incentive further research to study demographic problematics. Anyways, the general outcomes, shown in Table 2 regressions (2) and (3), suggest interesting effects for both groups.

Grades and family conditions

Family conditions take into consideration home stability, which is important since a good family environment is important for students to be happy and therefore concentrate on studying and enjoy their day to day. Parental involvement in educational matters takes into account how much is their interest in their children's course grades, homework and exams. Thus, it works as a proxy to identify if parents are actively involved in their progenitors' academic achievement. Parent's education is interesting since it is most probably related to their area of specialization and income, and since there are not collinearity issues it works as another control for associated income quintile, next to their employment situation. These four categories take as base level 'Non educated' or 'Unemployed' respectively. Proceeding with the analysis, daily study hours had an increase in the coefficient values, but this is expected since there is not the income quintile variable to avoid collinearity with parent's employment situation. Considering the construction of the two binary variables, it is unexpected to have a high statistical significance on 'Parental involvement with education' with a negative coefficient of 16.73 ($p > |2.576|$). This may suggest that parents too involved in their kid's academic progress is more often when they are underperforming students. Conversely, 'Home stability' do has a positive correlation and it has a coefficient of 6.235, statistically significant to 1% ($p > |2.576|$). Thus, supporting the idea

that an adequate family environment is important in academic achievement. Both variables have similar outcomes all over the different demographic groups, all being significant at least to 10%.

The educational level variables demonstrate an evolution in each category that goes accordingly to the intuition of the existing literature. The only exception would be ‘kindergarten’ and ‘doctorate or PhD’ educational level achieved by the mother, but since it is not statistically significant ($p < |1.645|$) it does not matter (this happened because there are too few observations and high bias-variance in both categories). All other achieved levels of education are statistically significant at least to 10% ($p > |1.645|$) for the mother, and to 1% ($p > |2.576|$) for the father. Surprisingly, the highest coefficient for the mother’s education level is ‘degree’ which is better than specialization or technological general degrees, but it was expected to be lower than a master’s degree, which is a more prominent degree. The same situation it is not true for the father’s case, where the results are the expected ones, but considering that ‘doctorate or PhD’ are statistically significant it was expected this category to report a higher coefficient than the others because of the average salaries that those degrees have. After all, it is possible to say that a father’s education level has more consistent results, that appeal to theory, in comparison with mother’s outcomes. The disconnections of empirical intuition may be given by the common characteristics of the studied group. That is to say, all the students are attending to no-fee institutions, hence their parents may not be practicing a profession that goes accordingly to their latest university degree (that in the case of the doctorate will relate to the highest incomes in the society, thus a private school is accessible).

The parent’s labor situation is directly related to the comforts and luxuries that a family has access to. This includes various related to education, such as tutorship, class materials, books, paid guides on internet, among others. Therefore, the correlation of these categories with

the grade magnitude is as expected. The first thing to consider is that a household with a father that only studies does not have a statistical significance, but it is negative. The same is true for the mother, but with significance of 10% ($p > |1.645|$). Due to the low significance, the best thing to assume is that there is not a clear average effect that supports a correlation between grades and students whose parents are unemployed but studying. Nevertheless, students with parents full employed report better scores than the other groups, both with statistical significance of 1% ($p > |2.576|$). Moreover, the outcomes are significantly higher when the mother is in a paid employment situation. This difference between mother and father could be because of the social structure that a lot of families have in Ecuador, where the father works, and the mother does not. The magnitude effect of the mother also having an adequate profession provides better opportunities associated with income, hence influencing student's academic achievement.

The demographic analysis has been left to conclude this family section in view of the fact that the results are less homogeneous. When comparing the areas of residence, the first thing that stands out is that the urban coefficients are higher than the general OLS estimation, and the statistical significance of those is are similar too. The contrary is true for the rural area, where the coefficients are lower, but most of them do not even achieve a significance of 10%. This was expected given the fact that most people (if not all) of the rural area belong to the first two income quintiles.

When comparing by gender, it is possible to appreciate that women always report higher magnitudes in grade than men, and most of the standard errors demonstrate high statistical significance for women. While for men most are not significant, but they are more alike the general regression. It is interesting to find these results, since the traditional literature would suggest that there are gender differences in school that create a more supportive environment for

men. When looking at the outcomes regarding academic achievement by family it is possible to see that this is not the case, and the number of observations suggest that there are not displaced estimations due to group composition.

Finally, ethnicity shows very ambiguous results, and a comparison is more difficult because some groups report better grades in some categories, while others report better grades in other ones. The most consistent thing to say would be that montubios (ethnicity that comes from the coast of Ecuador) have overall higher coefficients when they are statistically significant. The second ethnicity that has higher results are the white. Overall, the statistical significance is too variated in each category, which makes the analysis more difficult by and large. The montubios may be a combination of people that could be of the other three categories but do not identify themselves with those. Thus, the expected result is positive when comparing white with afro-descendants or indigenous, since they are reporting better outcomes. Anyhow, this comparison should be deepened through other methodology that includes representative weights, because there is a huge difference in observations between white people and the other ethnicities.

Grades and material conditions

The material conditions associated with income capabilities are more related to differences between different social classes. In this sense, the findings are more descriptive for the opportunities that poor people experience in comparison to more advantaged income levels that not only satisfy their basic needs, but also have enough money to have other material comforts. Therefore, to better illustrate the difference between both in Table 2, they have been separated between two groups, but they are all binary variables. The only exception would be ‘Arrival time (school)’, which is categorical with a base level of ‘less than 15 minutes.

The variables that showcase basic needs have lower coefficients than expected. Given their binary modeling, all of them have a magnitude direction according to the initial expectations, except for trash collection, which was supposed to be positive. Almost all the coefficients are statistically significant to 1% ($p > |2.576|$), and only 'Suffered hunger' ($p > |1.645|$) and 'Water' ($p > |1.960|$) are to 10% and 5% respectively. This suggests that there is a problem of academic achievement that is correlated to poverty implicit influence. Students who live in houses without a potable water service, poor shelter materials and insufficient food, score 1 to 3 points lower than their peers that are not affected by these deficiencies. Even summing them up, it is not a worrying outcome, but since this has not a causal interpretation it should be revised with a different data approach. Either way, in Table A1 the students for rural houses show higher coefficients, which are more significative and therefore should be taken into consideration for further research. In contrast, students that must work, that do not have electricity or do not have sanitary system, do have relatively high outcomes (-24.91 and 20) that are statistically very significant. In the cases of 'Works for money' and 'Electricity' this was pretty intuitive and expected since they are connected to time available and technological advantages to study. But it is surprising to see 'Sanitary' having a similar coefficient, given the fact that pipped water has a low value in comparison. This may be because of all the development programs that were used to provide clean water among all the population in Ecuador, but there have not been similar programs to provide moder sanitary mechanisms. Also, it is important to take into consideration that this may be related to health, and that could affect attendance at school or the student's spam of attention.

Moving into material comforts, the overall coefficients are higher than basic needs, and all of them are significant to 1% ($p > |2.576|$). It is not surprising to see that the highest of them

all comes from using electronic devices for studying, hence driving the interpretation that comforts that come from better income levels are associated with advantages that promote academic achievement. In this section, the only variable that does not behave as expected is 'Own bedroom', which is negative. The literature review suggests that having one's own bedroom should encourage independence and be a quiet place to study. Even though, the results suggest the opposite. The other four variables could be seen as tools that facilitate studying conditions, and as such they behave according to the main suppositions. Anyways, it is interesting that having internet has a lower outcome than having a laptop. The difference of effects between necessities and comforts may be because of how households prioritize goods and services, where Duflo explains that poor people usually see more utility in having luxury goods than satisfying their basic needs. Public policy cannot afford giving a computer to every household, but they surely can provide homogeneous basic services (maybe even with subsidies in the poorest areas) all over the country to allow better development opportunities in the areas that do not have them. Thus, promoting equity through specific things that will allow disadvantaged people to spend in luxuries without reproducing their detrimental situation because of their elections.

Regarding the hours that students daily dedicate to study, even though they are all statistically significant to at least 5% ($p > |1.960|$), the outcomes are not as expected. The supposition was that there will be a decreasing behavior, but this is not the case. The idea of including this variable was to see if there was the described effect and give notions of the situation that a lot of students face day to day, which is walking to school. Anyhow, this variable could be of interest in interaction with a variable that identifies the means of transportation, but the used database did not have any variable that does that.

Finally, the area demographic regressions exhibit that there are minor differences in the coefficients between rural and urban students, in addition to what mentioned earlier. The only exception would be electricity, which has a considerably larger but positive effect of 28.43 ($p > |2.576|$). In the case of material comforts, all the magnitudes are higher in the urban area than in the rural area. This suggests that the most developed places take more advantage of the additional tools at their disposition. Furthermore, these findings could motivate research or field experiments that identify possible differences in people's capabilities due to their living conditions.

When contrasting men and women, it is interesting to find that men who work have an average marginal score of -29.63 ($p > |2.576|$) on grades, that is worse than women who work and perceive a coefficient of -24.06 ($p > |2.576|$). However, in all the other measurements of basic needs men report higher outcomes, while in the material comforts women report the higher ones. An important study relay on this matter since it seems to be a gender inequality on the lower income quintiles that can slightly be noted from the outcome differences when comparing basic services against material comforts. On top of that, the same situation is recognized when setting side by side ethnicity results. On the contrary of family conditions outcomes, the montubios and whites have better outcomes in almost every measured category. Thus, it is important to notice that living conditions coming from socioeconomical status are presenting demographic gaps that go in accordance with the traditional literature regarding discrimination.

Basic model with controls

Up to this point, the motivation to do this analysis has been proven to be pertinent through the outcomes regarding income and grades, and the effects regarding family and material conditions have demonstrated that this is a problematic for Ecuadorian students looking out for

education to provide them with opportunities for social mobility. In this sense, the last regression (4) in Table 2 aims to analyze the marginal effects of income quintile in academic achievement for students that divulgated their living conditions with respect to family and material belongings. Something interesting to emphasize is that the hours of study (a control included in all the regressions) has converged to approximately the same coefficients as the 1st regression with no controls (Table 1). Also, is important to take into consideration the changes in variable construction that are described in *Methodology* (1.4).

The first thing to highlight is that the statistical significance has been completely lost for the first two comparison categories ('Quintile 2' and 'Quintile 3'). The 4th income quintile moved from being 1% ($p > |2.576|$) to a statistical significance of 5% ($p > |1.960|$). The 5th income quintile remained with the same statistical significance of 1% ($p > |2.576|$). The second thing to highlight is that there has been an overall reduction in the categorical coefficients, and this has only happened for 'Income quintile', while 'Daily study hours' only had an increase in its standard errors.

These results may be given be given especially because of the observations reduction from approximately 214 thousand to 15 thousand. The loss of data is inevitable when including the controls, since only students that answered all the questions are being taken into consideration. The limitation is one more present because of the questionnaire methodology. Regardless, the difference of the magnitude of the coefficients of being from the top quintiles are 7.148 and 15.51, which are still a high amount. In view of, that only students form public schools are taken into consideration, these results showcase a significant difference in higher education opportunities for the students. The statistical research that has been done suggests that effectively there may be a problem of living conditions influencing academic achievement in Ecuador.

Consequentially, social mobility remains a possible effect of this, and that will be analyzed in the following section.

Income average and grade cuts

The next step for the MA is to identify the average income from what people who were surveyed for the Enemdu report. Afterwards, the minimum grade obtained from the 2019 Senescyt's database is used to make a proxy variable for grade cut. The detailed process can be reviewed in the *Methodology* section. With that, the outcomes are presented in Table 3.

Table 3. Average income and minimum grade for the most demanded careers

Career's name	Average income	Minimum grade cuts
High		
Mechanical engineering	$ 1,534.45	793
Medicine	$ 1,470.74	757
Industrial engineering	$ 1,390.71	804
Law	$ 1,146.36	750
Medium		
Business administration engineering	$ 920.65	622
Systems engineering	$ 913.33	622
Environmental engineering	$ 847.12	615
Marketing engineering	$ 803.94	623
Low		
Tourism administration engineering	$ 667.74	578
Automotive mechanics technological degree	$ 667.08	565
Degree in computer science	$ 655.26	546
Degree in kindergarten education	$ 640.76	565

Notes: Only twelve careers were selected to lighten the analysis. They were selected by taking into consideration student's demand and enough observations to calculate an average.
Source: Author's calculations of averages and cuts using Enemdu's and Senescyt's databases respectively.

With naked eye, it is easily seen that there is a correlation between average income and grade cuts. After running a correlation calculation for these twelve careers, it is safe to say that the correlation between average income and grade cuts is 96.79% for this sample data. Moreover, it is surprising to see that the average income difference between two careers can vary a lot even if the admission requirement variation is not that big. For example, in the high-income section, the average income rest between Medicine and Law is of more than $420 (that is almost a minimal wage nowadays), but the score cut only requires 7 extra points to enter medicine. Also, it is important to consider that some universities have severe grade cuts, as shown in [Annex 1]. It is also perceived that the marginal variation of average income is of decreasing nature, and that can be noticed in each of the three levels. Grades on the other hand, are not always decreasing, but there is a significative difference (more than 200 points) between the high and the low level. Graph 1 illustrates better the parallel correlation.

Graph 2. Average income and minimum grade for the most demanded careers

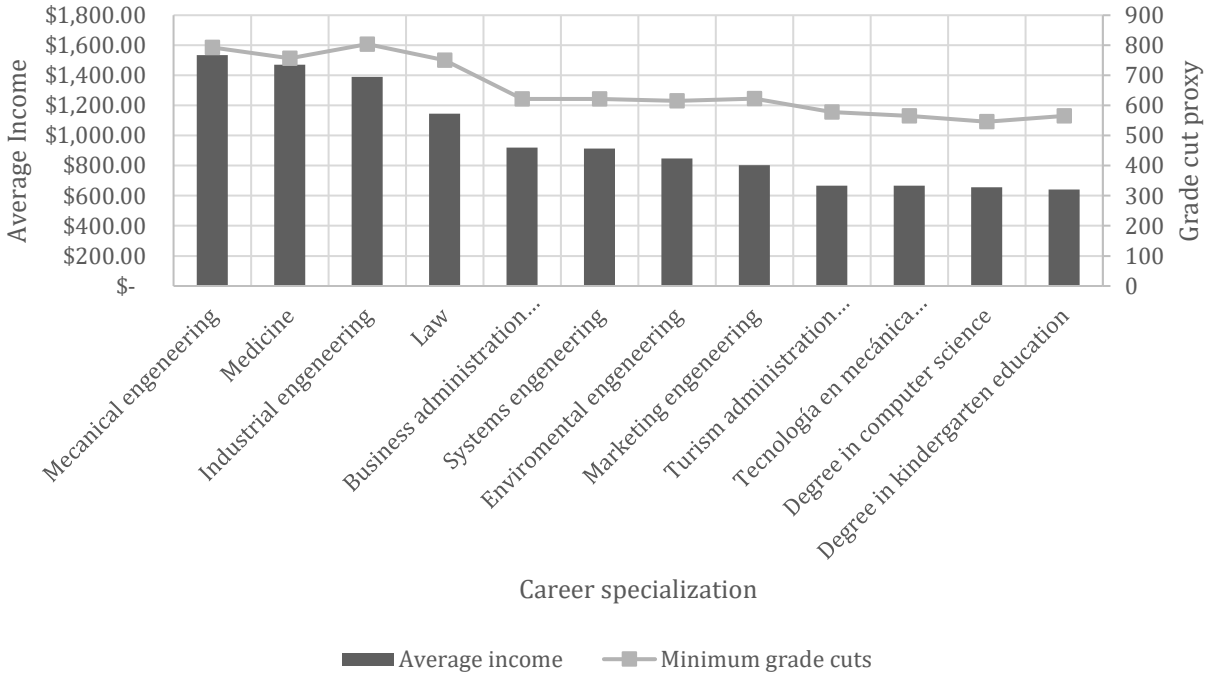


Table 4. Probability of achieving the grade cut for each career

	High average income				*Medium average income*				*Low average income*			
Variables	Mechanical engineering	Medicine	Industrial engineering	Law	Business administration engineering	Systems engineering	Environmental engineering	Marketing engineering	Tourism administration engineering	Automotive mechanics technological degree	Degree in computer science	Degree in kindergarten education
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quintile 1	0.116	0.185	0.0983	0.196	0.745	0.745	0.765	0.732	0.904	0.948	0.983	0.948
	(0.0107)	(0.0129)	(0.00996)	(0.0131)	(0.0129)	(0.0129)	(0.0125)	(0.0132)	(0.00837)	(0.00613)	(0.00331)	(0.00613)
Quintile 2	0.123	0.185	0.109	0.204	0.738	0.738	0.768	0.723	0.914	0.953	0.983	0.953
	(0.00830)	(0.00976)	(0.00789)	(0.0101)	(0.0105)	(0.0105)	(0.00999)	(0.0107)	(0.00644)	(0.00477)	(0.00285)	(0.00477)
Quintile 3	0.125	0.191	0.107	0.208	0.751	0.751	0.779	0.736	0.916	0.954	0.982	0.954
	(0.00674)	(0.00802)	(0.00631)	(0.00829)	(0.00873)	(0.00873)	(0.00836)	(0.00890)	(0.00552)	(0.00410)	(0.00260)	(0.00410)
Quintile 4	0.138	0.22	0.119	0.239	0.755	0.755	0.778	0.742	0.914	0.951	0.979	0.951
	(0.00617)	(0.00745)	(0.00578)	(0.00769)	(0.00784)	(0.00784)	(0.00757)	(0.00797)	(0.00512)	(0.00393)	(0.00261)	(0.00393)
Quintile 5	0.157	0.241	0.135	0.257	0.788	0.788	0.81	0.777	0.932	0.961	0.985	0.961
	(0.00709)	(0.00833)	(0.00664)	(0.00849)	(0.00801)	(0.00801)	(0.00769)	(0.00815)	(0.00495)	(0.00383)	(0.00246)	(0.00383)
Observations	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090

Notes: Standard errors in parenthesis. The probability of scoring higher than the cut for each of the 12 selected careers. It is controlled for the same variables as *Table 2 regression (4)* including hours of study. Careers are in descending order by average income.

Source: Author's regression using Enemdu's, Senescyt's and Ineval's databases

Career access by income quintile

To conclude the mediation analysis, a probit regression is made to see the probability that students from each income quintile have to enter each career. The suggested methodology does not compare the risk rates as a multinomial logistic does, where the probability of entering a certain career takes all categories into consideration. This limitation comes from the multiple datasets that had to be employed to complete the analysis. Since the Ineval's database does not report the institution of higher education to which each student was assigned, a proxy had to be made to simply identify how probable is that a student score higher than certain grade cut, given their family and material conditions. The results are shown in Table 3, and all of them have statistical significance of 1% ($p > |2.576|$) due to the structure of the regression. In simple terms, as shown in [Annexes 5-18], the grade distributions according to their responses are cumulated in different areas, but the extreme values are the ones that show larger gaps. Anyways, some cases are not graphed because they are too dispersed to the extremes, but they suggest that not all students are limited by their income quintile or their living conditions. Thanks to this, the probabilities are never 0% nor 100%.

As expected, the chances of scoring enough points to study careers associated with high income level are comparably much lower than for mid and low sections. The average difference between mid and low is approximately 30%, while for high and mid is approximately 55%. The second part of the hypothesis is also accepted since students from the top income quintile show higher probabilities at every specialization, especially the ones classified as 'High income average'. Which also gives the presumption that they can basically aim for whatever career they want and will have higher chances to enter than children from other income quintiles. The same is not true for the other groups of the category. Moreover, the high average income division is

the only one that consistently outcomes growing probabilities for each income quintile. Therefore, the analysis that comes next will be for the other two segments, while excluding most of the time the 5th income quintile from the interpretation.

Starting with the low average income segment, the income quintile that reports higher probabilities than the other three of ending up here is the 3rd one, except for degree in computer science (11) were quintile 1 and two report higher coefficients. In the middle section, quintile 4 students have higher probability of scoring enough point for those specializations than the other income groups, and for careers (5), (6) and (8), the 1st income quintile reports higher values than 2nd quintile, but not higher than quintile 3. It is also possible to appreciate that in these two groups the difference between the 4 quintiles is of 1% to 2% when comparing the lowest probability with the highest one. When also taking into consideration the 5th income quintile the difference is a maximum of 3% or 4% when compared to low and mid respectively. This means that everyone has pretty much the same chances to achieve a similar score when compared to their peers for grades between 546 and 623, independently of their social status and living conditions. Also, it could be said that most people form quintiles 1, 2 and 3 have minimal higher chances of obtaining grades between 546 and 578 than quintile 4, but it is the other way in the next income segments and with more margin. This behavior is more insinuated when taking into consideration income quintile 5. First, it can be said that students from the best income quintile always have better chances of reaching the grade cut (no matter how smaller it is the difference), but careers with better income average do have a greater margin that goes up to 7% between quintiles 1 and 5. Second, the fact that medicine and law were the two specializations that had a lower score requisite but higher difference in the outcomes, suggests that an additional comparison should be made for robustness check.

Robustness check for career access by income quintile

Taking average as new grade cut for binary modeling, the last part of analysis will be run again. Table 5 shows that the average grades do not behave as the lower grades proxy, and some careers present drastic changes. The motivation to do use this robustness test is to perceive if there is a similar comparison of average probabilities to score above higher requirements. In this sense, these results in Table 6 also reflect a realistic point of view for students interested in this research, which is that score above the average weights more than just mitting the minimal grade

Table 5. Average income and average grade for the most demanded careers

Career's name	Average income	Average grade cuts
High		
Mechanical engineering	$ 1,534.45	850
Medicine	$ 1,470.74	939
Industrial engineering	$ 1,390.71	789
Law	$ 1,146.36	852
Medium		
Business administration engineering	$ 920.65	798
Systems engineering	$ 913.33	763
Environmental engineering	$ 847.12	767
Marketing engineering	$ 803.94	772
Low		
Tourism administration engineering	$ 667.74	711
Automotive mechanics technological degree	$ 667.08	759
Degree in computer science	$ 655.26	773
Degree in kindergarten education	$ 640.76	712

Notes: Only twelve careers were selected to lighten the analysis. They were selected by taking in consideration student's demand and enough observations to calculate an average.
Source: Author's calculations of averages and cuts using Enemdu's and Senescyt's databases respectively.

expected by institutions. The results of average scores are also closer to the ones in [Annex 2].

Table 6. Probability of achieving the grade average for each career

	High average income				*Medium average income*				*Low average income*			
Variables	Mechanical engineering	Medicine	Industrial engineering	Law	Business administration engineering	Systems engineering	Environmental engineering	Marketing engineering	Tourism administration engineering	Automotive mechanics technological degree	Degree in computer science	Degree in kindergarten education
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Quintile 1	0.0539	0.0142	0.119	0.0512	0.109	0.176	0.163	0.151	0.296	0.182	0.149	0.296
	(0.00767)	(0.00469)	(0.0108)	(0.00747)	(0.0105)	(0.0127)	(0.0123)	(0.0119)	(0.0147)	(0.0128)	(0.0119)	(0.0147)
Quintile 2	0.059	0.0083	0.128	0.0561	0.116	0.174	0.166	0.162	0.314	0.18	0.158	0.314
	(0.00599)	(0.00231)	(0.00847)	(0.00584)	(0.00813)	(0.00955)	(0.00938)	(0.00930)	(0.0115)	(0.00969)	(0.00922)	(0.0115)
Quintile 3	0.0548	0.00813	0.131	0.052	0.118	0.174	0.165	0.158	0.326	0.182	0.152	0.326
	(0.00460)	(0.00176)	(0.00687)	(0.00448)	(0.00658)	(0.00774)	(0.00757)	(0.00744)	(0.00955)	(0.00788)	(0.00732)	(0.00955)
Quintile 4	0.0642	0.0102	0.144	0.0629	0.129	0.209	0.194	0.186	0.367	0.215	0.179	0.367
	(0.00433)	(0.00170)	(0.00630)	(0.00429)	(0.00599)	(0.00732)	(0.00711)	(0.00700)	(0.00870)	(0.00740)	(0.00689)	(0.00870)
Quintile 5	0.0723	0.0102	0.163	0.0703	0.144	0.224	0.21	0.202	0.408	0.232	0.192	0.408
	(0.00498)	(0.00180)	(0.00718)	(0.00492)	(0.00681)	(0.00810)	(0.00790)	(0.00779)	(0.00958)	(0.00820)	(0.00764)	(0.00958)
Observations	15,090	14,841	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090	15,090

Notes: Standard errors in parenthesis. The shows the probability of scoring higher than the average grade for each of the 12 selected careers. It is controlled for the same variables as *Table 2 regression (4)* including hours of study. Careers are in descending order by average income.

Source: Author's regression using Enemdu's, Senescyt's and Ineval's databases

Given what has been said, Table 5 shows the new grade cuts that go accordingly to administrative data and are more related to institutions' expectations of students. Table 6 shows the new probabilities after the changes, where all of them remain with the same statistical significance ($p > |2.576|$). It is evident that the overall coefficients are much lower. Also, it is interesting that the difference between probabilities form the high average income section are larger than before, but medicine shows a different behavior than anything expected. After the regression (2) from Table 6 was done, the most surprising outcome was seen in medicine, since the income quintile 1 has a highest coefficient than the others. After a deep analysis into this matter, it was concluded that approximately 300 observations from the 1st quintile were dropped because only students that have electricity achieve this score or higher.

This basically means two things. First, medicine is no longer comparable to the other careers due to the change in the composition of regression, but also because all categories are taking quintile 1 as base level and a change in it changes all the panoramic. Second, the outcomes may have lost significance as comparable coefficients, but it still provides an important intuition of the importance of basic needs for academic achievement. In this case electricity is one of the most important things for people to have, but these results somehow are the only ones that give causality notions despite it is a statistical analysis. Going back to the main point, when comparing the last results with these new ones, it is also possible to see an increased effect of poverty conditions and income situation on academic achievement, which is perceived through the increased gap all over the coefficients (better illustrated when comparing quintile 1 and 5). Thus, endorsing the previously mentioned statements about the hypothesis.

CONCLUSIONS

To conclude, the motivation behind this research was to provide an insight of an ongoing problematic in Ecuador and many countries around the world. Education should be a priority for mandataries and policy makers, since it represents the best opportunity to raise future generations with equal competitive advantages. The issue of social reproduction shall be taken more seriously since a different perspective about it changes the panoramic. Two questions arise from this motive, and the hypothesis point that a statistical correlation between average income expectations and childhood living conditions is inherent. Indeed, the findings suggest that this correlation exists, and the living conditions associated with poverty create relatively significant gaps in academic achievement. Children under poverty conditions or family associated disadvantages show the same behavior independently of the demographic group, which is that they score worst notes on average (Table 2 gives a statistical description of these outcomes, and [Annexes 5-18] illustrates a crescent tendency of divergence as grade is higher). These gaps are much higher when comparing students from income quintile 1 and 5, especially in their report of accessibility probabilities for careers that insinuate better monthly salaries.

In resume, socioeconomical status influences education more than education influences social mobility. In simple terms, if the living conditions coming from income capabilities do not allow full academic achievement, then any homogeneous educational policy will fail to promote equalitarian learning. Even though the empirical analysis does not show causality, it does show strong correlations that should incentive more interest in this matter.

Limitations and further contributions

This investigation initially had a lot of limitations and showed a lot more in the process. The main limitation was that the main database did not have administrational backup, and all the data collected was based on students' perception of things. This may cause an overestimation of the effect, since a lot of students took the questionary as a joke or did not know the real information to answer some questions. On the other hand, Enemdu's database is not always representative for all the states and cities all over the country, thus causality is hard to prove. Consequently, this research is not intended to show any causality and the coefficients are purely statistical. As a limitation, this makes it hard to build a concrete argument that shows effects between the studied variables. Even though, the correlations do outcome important results for the literature in this matter. Moreover, the database is representative for the population, but a lot of observations were lost when controlling for all the family and material conditions variables, which raises a series of doubts about the results.

Nevertheless, the concluded investigation shows interesting results that may motivate economical researchers to create experiments that can test for causality of implicit poverty factors in education. Ecuador is still an exceptional case for related studies to be done. Even though, the problem of the need to use multiple databases remains as the main limitation despite the multiple analyzing tools. For further contributions, rigorous questionaries or field observations should be made to make possible the analysis of effects that certainly do exist. Preferably, all the answers should be placed in one common database that can be contrasted with administrative archives. The contributions to this scope may give more possibilities to build a path to a more equalitarian society.

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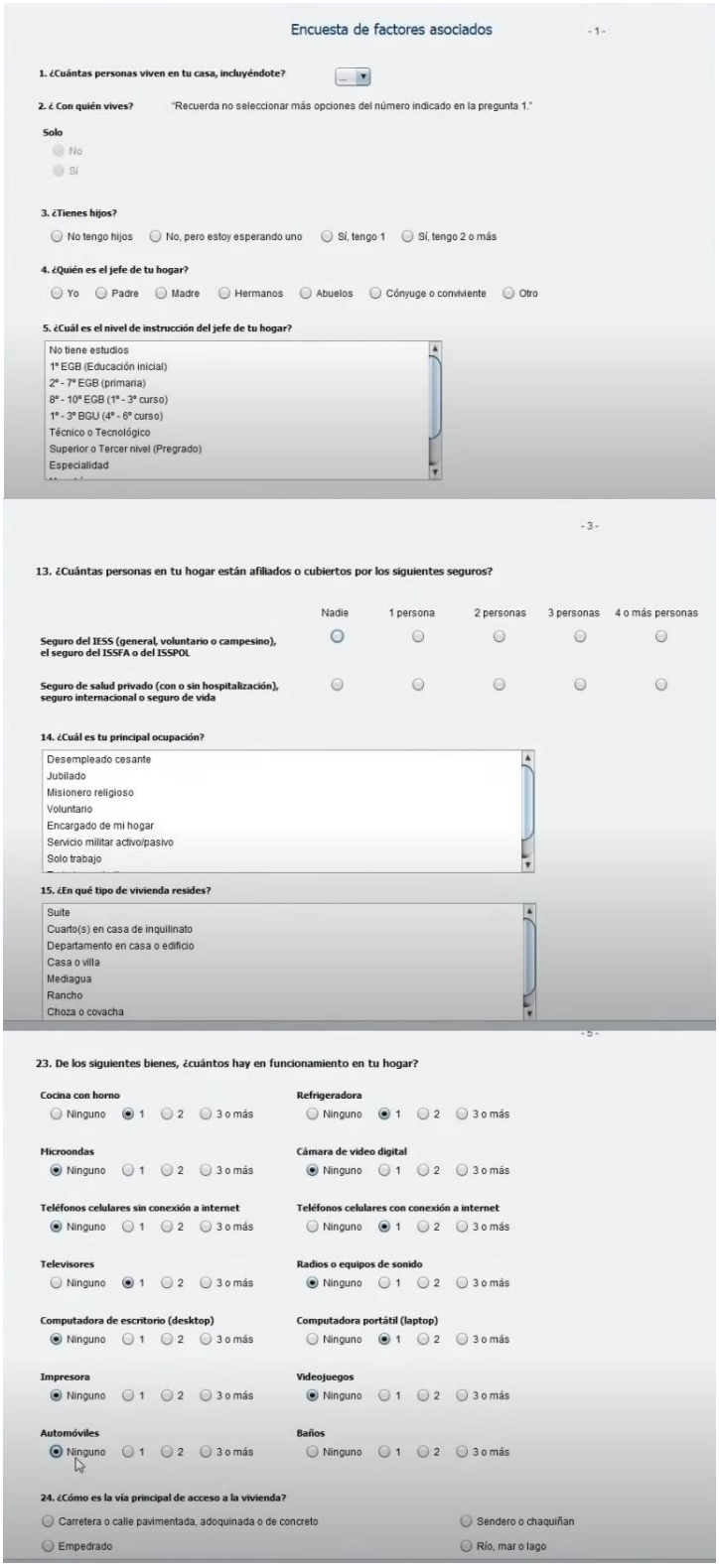
ANNEX 1. EVIDENCE ON THE QUESTIONNAIRE OF THE EFA.



Encuesta de factores asociados - 1 -

1. ¿Cuántas personas viven en tu casa, incluyéndote?

2. ¿ Con quién vives? "Recuerda no seleccionar más opciones del número indicado en la pregunta 1."

Solo
No
Sí

3. ¿Tienes hijos?
No tengo hijos | No, pero estoy esperando uno | Sí, tengo 1 | Sí, tengo 2 o más

4. ¿Quién es el jefe de tu hogar?
Yo | Padre | Madre | Hermanos | Abuelos | Cónyuge o conviviente | Otro

5. ¿Cuál es el nivel de instrucción del jefe de tu hogar?
No tiene estudios
1º EGB (Educación inicial)
2º - 7º EGB (primaria)
8º - 10º EGB (1º - 3º curso)
1º - 3º BGU (4º - 6º curso)
Técnico o Tecnológico
Superior o Tercer nivel (Pregrado)
Especialidad

- 3 -

13. ¿Cuántas personas en tu hogar están afiliados o cubiertos por los siguientes seguros?

	Nadie	1 persona	2 personas	3 personas	4 o más personas
Seguro del IESS (general, voluntario o campesino), el seguro del ISSFA o del ISSPOL					
Seguro de salud privado (con o sin hospitalización), seguro internacional o seguro de vida					

14. ¿Cuál es tu principal ocupación?
Desempleado cesante
Jubilado
Misionero religioso
Voluntario
Encargado de mi hogar
Servicio militar activo/pasivo
Solo trabajo

15. ¿En qué tipo de vivienda resides?
Suite
Cuarto(s) en casa de inquilinato
Departamento en casa o edificio
Casa o villa
Mediagua
Rancho
Choza o covacha

- 5 -

23. De los siguientes bienes, ¿cuántos hay en funcionamiento en tu hogar?

Cocina con horno: Ninguno | 1 | 2 | 3 o más
Refrigeradora: Ninguno | 1 | 2 | 3 o más
Microondas: Ninguno | 1 | 2 | 3 o más
Cámara de video digital: Ninguno | 1 | 2 | 3 o más
Teléfonos celulares sin conexión a internet: Ninguno | 1 | 2 | 3 o más
Teléfonos celulares con conexión a internet: Ninguno | 1 | 2 | 3 o más
Televisores: Ninguno | 1 | 2 | 3 o más
Radios o equipos de sonido: Ninguno | 1 | 2 | 3 o más
Computadora de escritorio (desktop): Ninguno | 1 | 2 | 3 o más
Computadora portátil (laptop): Ninguno | 1 | 2 | 3 o más
Impresora: Ninguno | 1 | 2 | 3 o más
Videojuegos: Ninguno | 1 | 2 | 3 o más
Automóviles: Ninguno | 1 | 2 | 3 o más
Baños: Ninguno | 1 | 2 | 3 o más

24. ¿Cómo es la vía principal de acceso a la vivienda?
Carretera o calle pavimentada, adoquinada o de concreto
Empedrado
Sendero o chaquiñan
Río, mar o lago

ANNEX 2. EXAMPLE OF A UNIVERSITY SCORE CUT FOR EACH CAREER.

CARRERA	CAMPUS	PROVINCIA	MODALIDAD	JORNADA	PUNTAJE REFERENCIAL
Ingeniería Civil	Matriz - Quito	Pichincha	Presencial	Intensiva	**681**
Ingeniería Química	Matriz - Quito	Pichincha	Presencial	Intensiva	**868**
Laboratorio Clínico	Matriz - Quito	Pichincha	Presencial	Intensiva	**917**
Matemática	Matriz - Quito	Pichincha	Presencial	Intensiva	**866**
Medicina	Matriz - Quito	Pichincha	Presencial	Intensiva	**933**
Medicina Veterinaria	Matriz - Quito	Pichincha	Presencial	Intensiva	**921**
Minas	Matriz - Quito	Pichincha	Presencial	Intensiva	**826**
Obstetricia	Matriz - Quito	Pichincha	Presencial	Intensiva	**920**
Odontología	Matriz - Quito	Pichincha	Presencial	Intensiva	**940**
Pedagogía de la Actividad Física y Deporte	Matriz - Quito	Pichincha	Presencial	Intensiva	**897**
Pedagogía de la Historia y las Ciencias Sociales	Matriz - Quito	Pichincha	Presencial	Intensiva	**897**
Pedagogía de las Ciencias Experimentales / Licenciado/a en Pedagogía de la Informática	Matriz - Quito	Pichincha	Presencial	Intensiva	**833**
Pedagogía de los Idiomas Nacionales y Extranjeros / Licenciado/a en Pedagogía del Idioma Español - Frances – Inglés	Matriz - Quito	Pichincha	Presencial	Intensiva	**880**

CARRERA	CAMPUS	PROVINCIA	MODALIDAD	JORNADA	PUNTAJE REFERENCIAL
Diseño Gráfico con nivel equivalente a Tecnología Superior	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**744 / 709**
Tecnología Superior en Administración Financiera	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**762 / 716**
Tecnología Superior en Asistencia en Farmacia	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**784 / 851**
Tecnología Superior en Desarrollo de Software	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**729 / 697**
Tecnología Superior en Desarrollo Infantil Integral	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**798 / 708**
Tecnología Superior en Gestión de Producción y Servicios	Matriz - Quito	Pichincha	Presencial	Nocturna	**744**
Tecnología Superior en Gestión del Talento Humano	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**854 / 734**
Tecnología Superior en Marketing	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**761 / 770**
Tecnología Superior en Optometría	Matriz - Quito	Pichincha	Presencial	Matutina / Nocturna	**753 / 810**

ANNEX 3. EFA QUESTIONS USED TO CREATE THE VARIABLES (TRANSLATED)

1. Quintile (Segregation of the population based on their socioeconomic index according to the associated factors survey conducted by Ineval).
2. In general, how many hours a day do you dedicate, or did you dedicate to studying school subjects or doing homework at home?
3. Does being at home make you happy?
4. Do your parents worry about your academic performance?
    a. Do your father or mother ask you if you did your homework?
    b. Was your family or guardian aware that you studied for exams?
    c. Was your family or guardian aware of your grades?
5. Indicate the highest educational level completed by your mother.
6. Indicate the highest educational level completed by your father.
7. Indicate what your father regularly does.
8. Indicate what your mother regularly does.
9. Works for money.
    a. Do you get paid for your work?
    b. If you work, when do you work?
10. In the last 30 days, how many times did you go hungry because there wasn't enough food?
11. House construction quality.
    a. For the most part, what material are the floors of your house made of?
    b. For the most part, what material are the exterior walls of your house made of?

12. Are any of these goods or services available in your home? Check all that apply: Potable or piped water.
13. Are any of these goods or services available in your home? Check all that apply: Electric power.
14. Are any of these goods or services available in your home? Check all that apply: Sewage or sanitation.
15. Are any of these goods or services available in your home? Check all that apply: Garbage collection.
16. Are any of these goods or services available in your home? Check all that apply: Your own room.
17. Are any of these goods or services available in your home? Check all that apply: A desk for studying.
18. Are any of these objects available in your home? Desktop computer.
19. Are any of these objects available in your home? Own laptop or portable computer.
20. In general, how many hours a day do you use electronic devices (such as a cell phone, tablet, or computer) to practice exercises or do schoolwork?
21. How long does it take you to get to your school?

ANNEX 4. FAMILY AND MATERIAL CONDITIONS ASSOCIATED TO INCOME, BY DEMOGRAPHIC BREAKDOWN

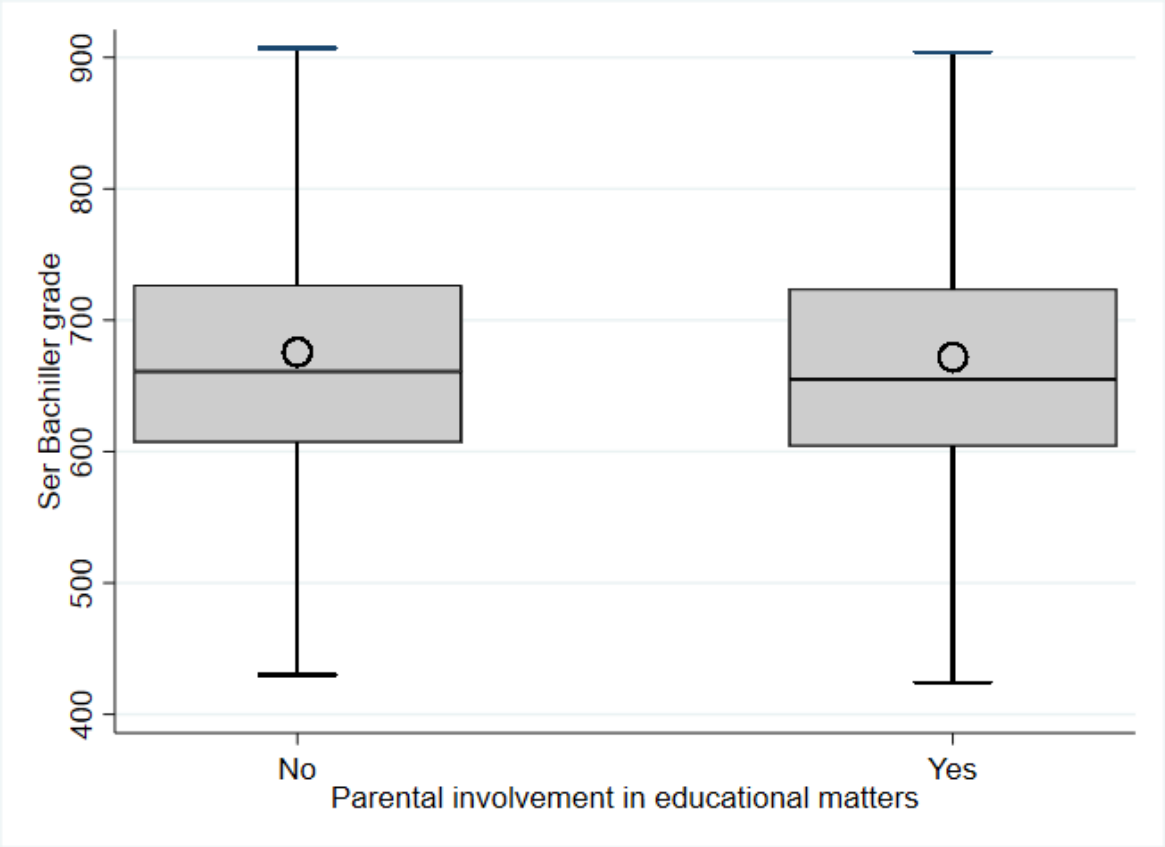
Variables	Urban		Rural		Men		Women		Ethnicity White		Ethnicity Afroecuadorian		Ethnicity Indigenous		Ethnicity Montubio	
	(1)	SE	(2)	SE	(3)	SE	(4)	SE	(5)	SE	(6)	SE	(7)	SE	(8)	SE
Family Associated Conditions																
Hours of study																
1 hour or less	15.99	(5.283)	25.28	(9.683)	21.66	(5.491)	17.72	(8.673)	18.84	(5.119)	9.485	(15.18)	17.70	(17.79)	16.99	(25.63)
1 to 2 hours	37.65	(5.237)	46.38	(9.627)	41.66	(5.441)	41.37	(8.624)	39.92	(5.075)	22.11	(15.05)	42.02	(17.73)	37.18	(25.52)
3 hours	61.69	(5.259)	61.44	(9.686)	62	(5.487)	65.44	(8.643)	62.72	(5.098)	38.32	(15.22)	58.07	(17.83)	50.16	(25.62)
4 hours or more	68.66	(5.256)	64.96	(9.696)	62.95	(5.496)	75.52	(8.638)	69.34	(5.096)	37.99	(15.19)	66.03	(17.83)	54.55	(25.61)
Home stability	6.327	(1.238)	6.16	(2.218)	3.854	(1.521)	8.555	(1.541)	5.502	(1.214)	7.533	(4.187)	6.346	(3.059)	10.65	(5.724)
Parental involvement in education	-17.54	(0.701)	-14.11	(1.282)	-17.61	(0.877)	-15.76	(0.863)	-16.76	(0.673)	-9.854	(2.724)	-8.937	(2.181)	-18.25	(2.933)
Mother's educational level achieved																
1º EGB (kindergarten)	-0.542	(2.864)	-3.464	(4.166)	-5.206	(3.351)	1.840	(3.355)	0.126	(2.814)	-6.920	(10.73)	3.267	(5.014)	0.351	(11.25)
2º - 7º EGB (primary school)	4.379	(2.009)	0.992	(2.864)	1.140	(2.373)	5.108	(2.304)	6.888	(2.001)	12.94	(7.424)	-0.846	(3.388)	7.510	(7.970)
8º - 10º EGB (high school)	6.039	(2.197)	0.610	(3.447)	-0.142	(2.635)	7.592	(2.580)	8.493	(2.184)	10.59	(7.953)	-3.477	(5.153)	7.682	(8.884)
1º - 3º BGU (baccalaureate)	16.39	(2.095)	14.1	(3.273)	8.643	(2.500)	20.21	(2.455)	18.63	(2.092)	19.71	(7.606)	9.819	(4.714)	23.74	(8.482)
Technology general degree	33.23	(3.145)	16.92	(6.752)	23.99	(3.888)	34.5	(4.014)	34.94	(3.124)	37.61	(12.32)	1.518	(11.58)	26.2	(14.50)
Degree	43.08	(2.495)	42.03	(5.053)	33.97	(3.060)	48.57	(3.064)	45.99	(2.493)	25.33	(9.757)	42.66	(8.936)	49.04	(10.29)
Specialization	17.3	(3.650)	6.072	(8.681)	6.353	(4.609)	22.76	(4.716)	19.37	(3.626)	24.89	(13.21)	2.686	(19.65)	3.619	(18.73)
Master’s degree	37.68	(4.413)	27	(10.64)	30.49	(5.395)	38.13	(6.033)	44.41	(4.420)	-10.64	(15.35)	24.76	(21.55)	13.72	(19.33)
Doctorate or PhD	-10.32	(13.86)	-30.79	(32.25)	-13.47	(15.75)	-18.71	(21.47)	-7.285	(14.14)	-26.95	(57.86)	1.620	(78.68)	-12.91	(39.91)
Father's educational level achieved																
1º EGB (kindergarten)	6.643	(2.882)	8.208	(4.358)	6.595	(3.385)	7.825	(3.447)	8.504	(2.813)	-8.508	(10.42)	5.002	(5.688)	6.522	(9.841)
2º - 7º EGB (primary school)	13.51	(2.059)	11.01	(3.140)	12.67	(2.462)	13.57	(2.431)	14.3	(2.016)	-10.22	(7.314)	9.704	(3.968)	18.29	(7.510)
8º - 10º EGB (high school)	11.8	(2.274)	12.71	(3.765)	10.84	(2.748)	12.13	(2.743)	14.3	(2.231)	-16.46	(7.884)	1.416	(5.494)	11.69	(8.636)
1º - 3º BGU (baccalaureate)	24.8	(2.142)	20.55	(3.484)	23.81	(2.582)	23.46	(2.570)	26.08	(2.105)	-5.565	(7.506)	8.789	(4.780)	27.11	(8.081)
Technology general degree	37.92	(2.935)	28.55	(6.188)	37.27	(3.621)	34.81	(3.757)	40.87	(2.902)	-12.82	(11.02)	-1.403	(8.904)	34.84	(14.68)
Degree	45.75	(2.564)	37.8	(5.102)	45.49	(3.164)	42.92	(3.189)	47.84	(2.534)	-3.192	(10.20)	2.453	(7.178)	52.31	(10.66)
Specialization	28.6	(3.809)	21.08	(9.393)	30.25	(4.765)	23.78	(5.061)	29.32	(3.809)	16.73	(13.65)	8.127	(16.78)	28.74	(16.39)
Master’s degree	56.21	(4.649)	22.24	(10.20)	56.18	(5.652)	45.2	(6.271)	56.97	(4.635)	-42.02	(20.41)	12.39	(13.14)	50.37	(21.16)
Doctorate or PhD	38.91	(10.14)	7.544	(25.86)	23.68	(12.22)	49.89	(14.68)	44.06	(10.56)	5.815	(32.58)	-15.79	(30.14)	7.441	(43.13)
Mother's employment situation																
Home employed (unpaid)	17.9	(1.616)	18.4	(3.292)	18.86	(2.118)	18.3	(1.986)	19	(1.591)	0.419	(5.555)	16.56	(5.767)	16.51	(6.372)
Employed (unpaid)	19.67	(2.864)	10.19	(5.341)	22.45	(3.628)	13.19	(3.509)	16.86	(2.828)	10.77	(10.57)	17.73	(7.695)	13.61	(13.53)
Underemployed	21.63	(1.769)	22.07	(3.657)	24.19	(2.319)	19.75	(2.188)	21.56	(1.743)	7.259	(6.187)	20.78	(6.299)	23.39	(7.478)
Only studies	-8.655	(6.249)	-26.23	(13.79)	-5.889	(7.989)	-16.42	(8.085)	-10.24	(6.171)	-3.014	(21.74)	-52.62	(28.45)	-4.650	(25.44)
Employed	29.18	(1.746)	27.41	(3.675)	32.11	(2.291)	26.25	(2.170)	29.33	(1.717)	11.65	(6.066)	26.06	(6.694)	28.09	(7.716)
Father's employment situation																
Home employed (unpaid)	-4.103	(2.507)	7.234	(4.042)	-2.429	(3.017)	0.744	(2.985)	-3.571	(2.437)	-5.468	(8.704)	11.38	(5.707)	4.072	(9.908)
Employed (unpaid)	6.905	(2.235)	15.1	(3.933)	6.266	(2.859)	11.34	(2.641)	9.161	(2.166)	4.147	(7.945)	10.93	(5.970)	1.758	(8.853)

Underemployed	5.575	(1.697)	12.48	(3.247)	7.023	(2.259)	6.692	(2.018)	5.19	(1.669)	2.018	(5.884)	25.58	(5.025)	7.205	(6.976)
Only studies	-12.26	(11.25)	-8.711	(23.72)	-2.485	(13.61)	-23.15	(15.25)	-16.51	(11.28)	-10.52	(33.33)	91.95	(45.84)	1.034	(44.77)
Employed	9.627	(1.713)	16.43	(3.344)	11.27	(2.280)	10.09	(2.051)	9.664	(1.684)	6.067	(5.987)	24.85	(5.380)	1.540	(7.233)
Observations	65,723		17,773		40,836		42,660		70,826		3,378		5,513		3,779	
R^2	0.113		0.072		0.096		0.115		0.110		0.050		0.082		0.085	
Material Associated Conditions																
Hours of study																
1 hour or less	6.427	(6.476)	-6.432	(12.53)	8.213	(6.686)	6.900	(11.09)	6.381	(6.619)	-25.41	(16.09)	29.97	(18.86)	1.219	(23.20)
1 to 2 hours	22.17	(6.414)	8.607	(12.46)	23.31	(6.624)	24.74	(11.02)	22.91	(6.560)	-22.31	(15.87)	39.69	(18.85)	10.80	(22.98)
3 hours	45.24	(6.452)	28.51	(12.55)	40.75	(6.693)	52.87	(11.05)	46.37	(6.594)	-14.79	(16.15)	53.58	(19.04)	23.32	(23.24)
4 hours or more	51.53	(6.448)	29.34	(12.57)	43.07	(6.706)	60.86	(11.05)	51.67	(6.592)	-5.954	(16.11)	60.02	(19.07)	34.12	(23.21)
Basic services																
Works for money	-26.36	(1.041)	-20.5	(1.859)	-29.63	(1.190)	-24.06	(1.502)	-26.88	(0.993)	-9.526	(3.735)	-16.41	(3.197)	-13.93	(4.445)
Suffered hunger	-1.069	(1.071)	-2.768	(1.985)	-0.845	(1.339)	-1.955	(1.328)	-1.279	(1.038)	8.839	(3.730)	-6.847	(3.183)	5.203	(4.796)
House materials (shelter)	3.949	(1.358)	6.637	(2.291)	2.378	(1.670)	4.442	(1.624)	2.48	(1.288)	1.038	(5.026)	17.62	(4.060)	14.85	(5.155)
Electricity	13.1	(4.145)	28.43	(4.899)	25.9	(4.472)	13.99	(4.547)	8.622	(4.115)	24.06	(12.64)	30.03	(5.626)	14.16	(12.46)
Water	2.613	(1.666)	6.785	(2.378)	4.253	(1.945)	2.046	(1.924)	2.066	(1.556)	-4.408	(5.827)	27.55	(3.940)	-11.99	(5.001)
Sanitary	18.1	(1.099)	16.58	(2.195)	19.03	(1.384)	15.04	(1.382)	18.27	(1.062)	1.174	(3.929)	15.94	(3.936)	2.622	(5.300)
Trash collection	-9.463	(1.573)	-2.838	(2.302)	-6.486	(1.830)	-9.185	(1.825)	-9.378	(1.454)	-3.312	(5.730)	1.943	(3.791)	-3.817	(5.108)
Material comforts																
Own room	-6.883	(1.030)	-8.238	(1.938)	-4.353	(1.314)	-9.014	(1.259)	-6.453	(0.993)	-6.783	(3.787)	-11.96	(3.314)	-0.962	(4.241)
Studying desk	14.88	(1.027)	2.105	(1.901)	9.451	(1.289)	14.35	(1.269)	13.5	(0.993)	7.75	(3.592)	-2.059	(3.302)	2.317	(4.342)
PC	10.49	(0.993)	9.808	(2.142)	8.569	(1.260)	10.89	(1.282)	10.65	(0.964)	9.672	(3.702)	12.31	(3.993)	2.873	(5.110)
Laptop	19.02	(0.976)	13.6	(2.021)	16.84	(1.228)	18.15	(1.255)	18.48	(0.946)	10.53	(3.690)	7.43	(3.504)	15.35	(4.920)
Internet	15.47	(1.432)	12.08	(2.241)	14.91	(1.721)	13.03	(1.702)	15.84	(1.374)	15.17	(4.682)	-0.488	(3.405)	11.28	(4.957)
Uses electronic devices to study	21.74	(1.959)	17.04	(3.365)	15.55	(2.363)	25.96	(2.432)	20	(1.905)	14.04	(6.110)	21.63	(5.203)	25.16	(7.277)
Arrival time (school)																
Between 15 and 30 minutes	4.695	(1.059)	0.795	(2.001)	5.664	(1.319)	1.405	(1.326)	3.915	(1.016)	-1.514	(3.799)	7.338	(3.578)	-11.29	(4.688)
Between 31 minutes and an hour	10.17	(1.300)	0.913	(2.557)	9.642	(1.618)	5.844	(1.653)	8.381	(1.256)	2.429	(4.918)	2.674	(4.375)	-4.990	(5.714)
More than an hour	10.32	(2.172)	-12.72	(3.803)	3.832	(2.639)	5.152	(2.700)	4.521	(2.081)	8.272	(8.731)	6.068	(5.737)	-15.87	(8.966)
Observations	37,716		9,333		23,115		23,934		40,568		2,145		2,414		1,922	
R^2	0.129		0.113		0.124		0.131		0.125		0.046		0.209		0.064	

Notes: An OLS simple regression has been made to estimate the difference of grades that each factor causes. SE (standard error). All variables are binary except for the ones that represent a level (like parent's education) or hours, which are categorical with base levels being the first one (thus, they show evolutive behavior). EGB stands for General Basic Education and BGU for General Baccalaureate Education. All binary variables take value of 1 for "Yes" and 0 for "No" responses. Also, it is important to take into consideration that family and material conditions are separate regressions with the formula suggested in the *Methodology* section. Demographic breakdown identifies differences between area of residence, gender, and ethnicity.

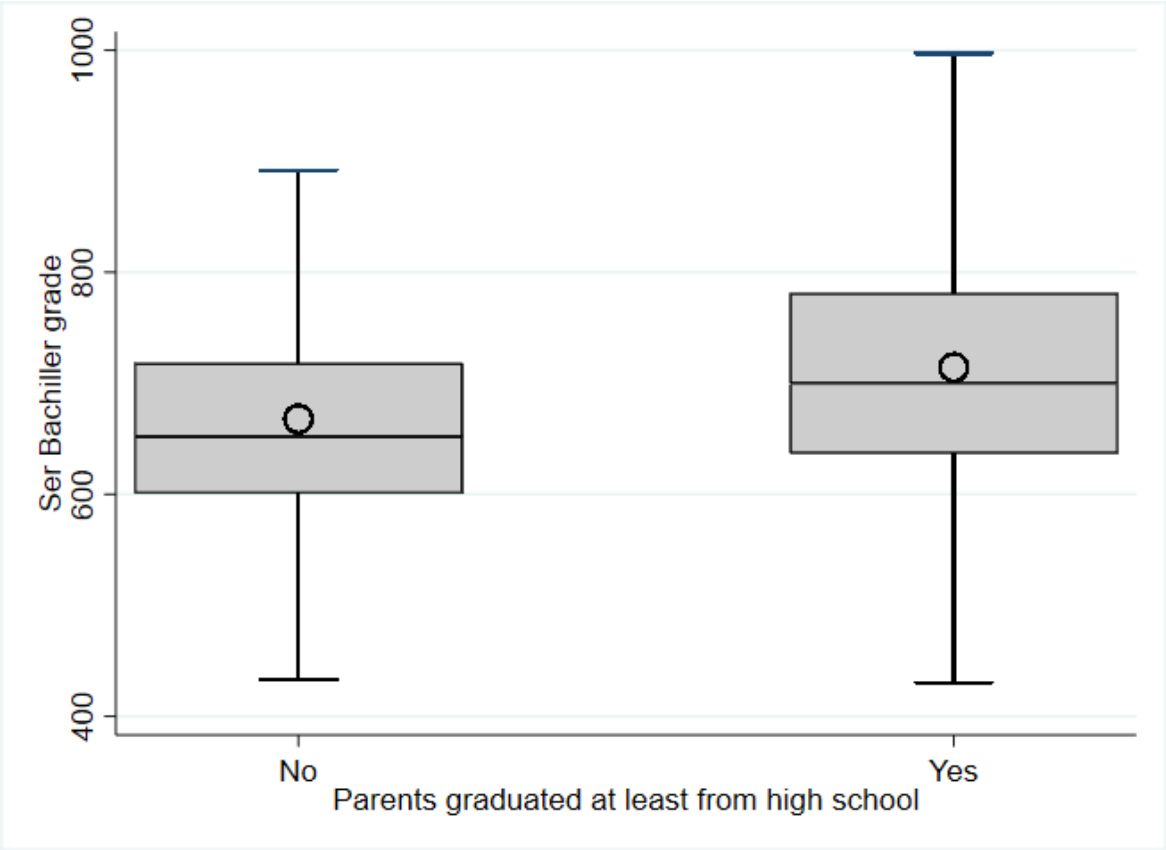
Source: Author's regressions using Ineval's database

ANNEX 5. BOX GRAPH FOR *PARENTAL INVOLVEMENT IN EDUCATION*



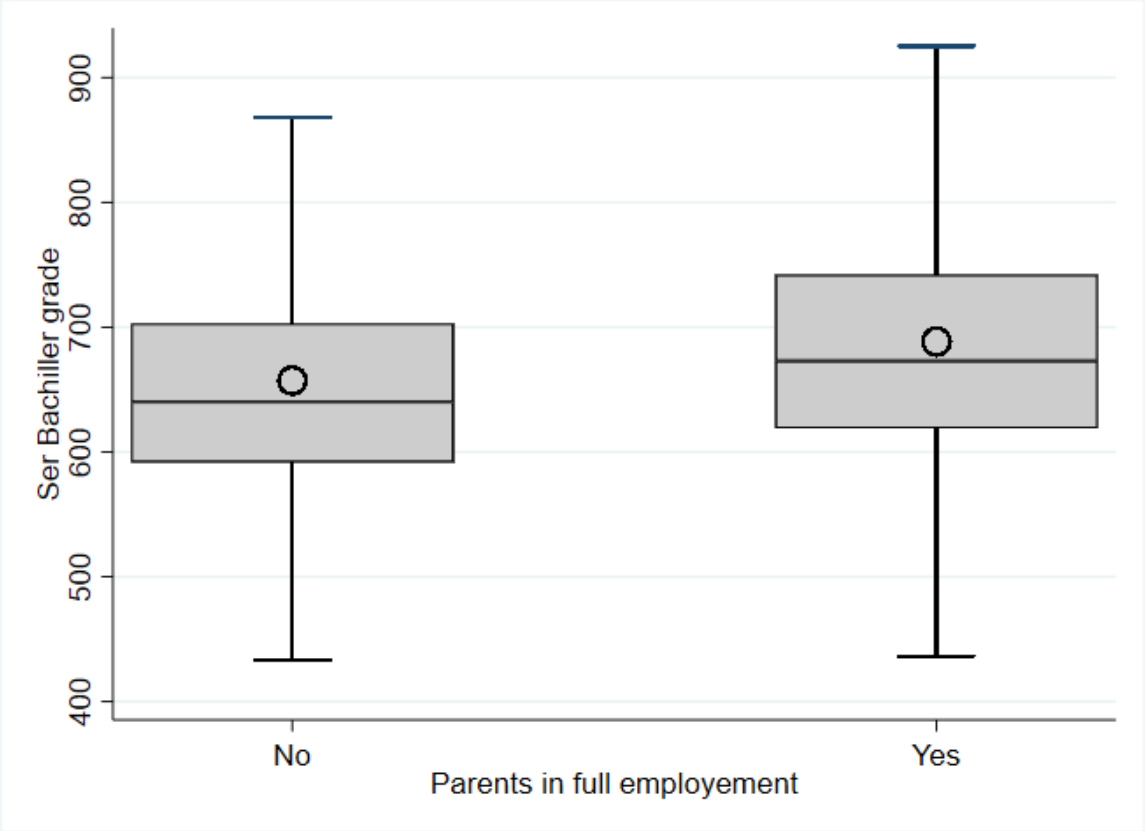
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 6. BOX GRAPH FOR *PARENTS' EDUCATIONAL LEVEL ACHIEVED*



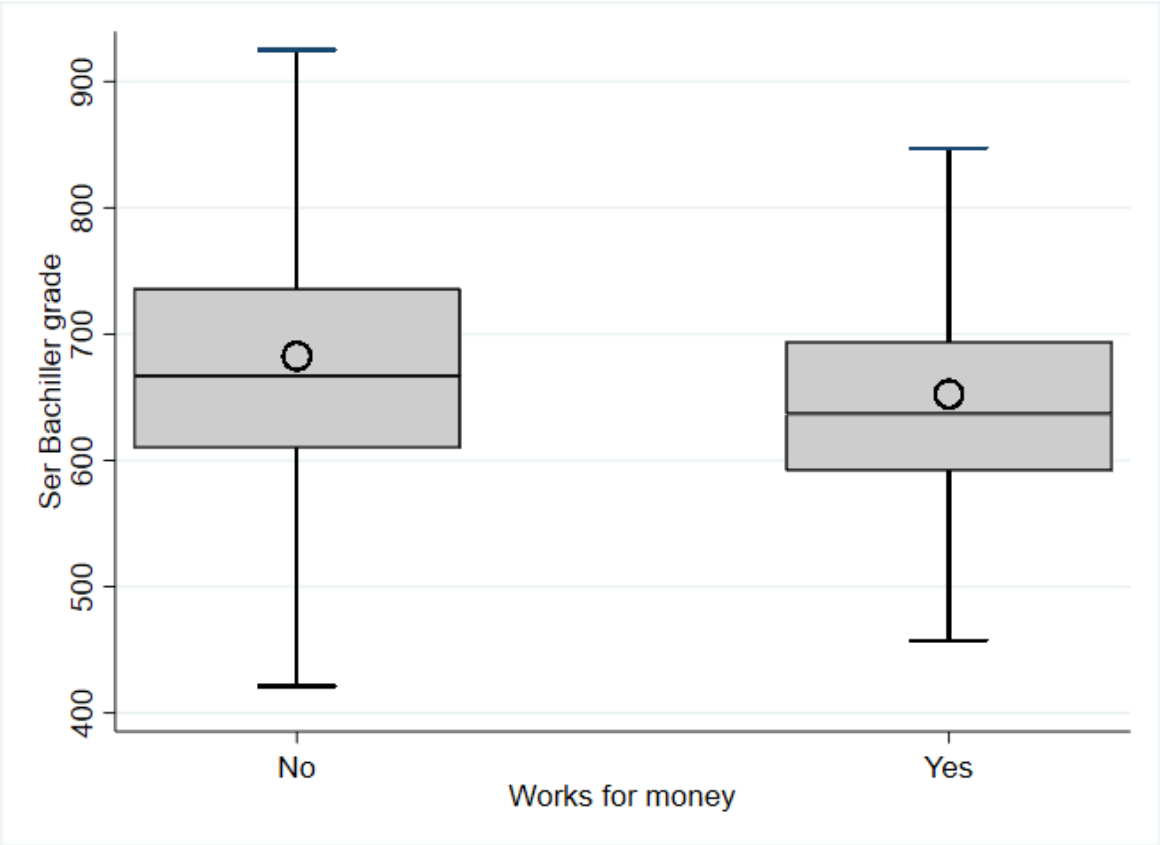
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 7. BOX GRAPH FOR *PARENTS' EMPLOYMENT SITUATION*



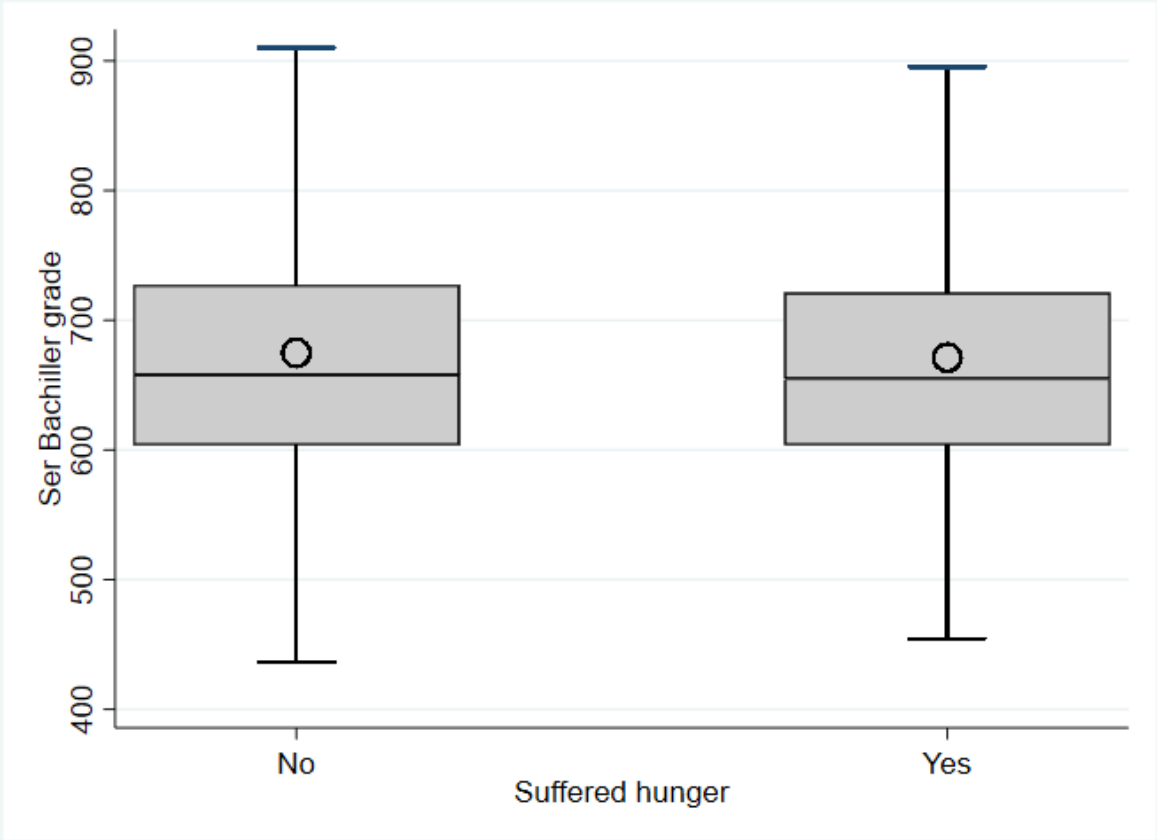
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 8. BOX GRAPH FOR *WORKS FOR MONEY*



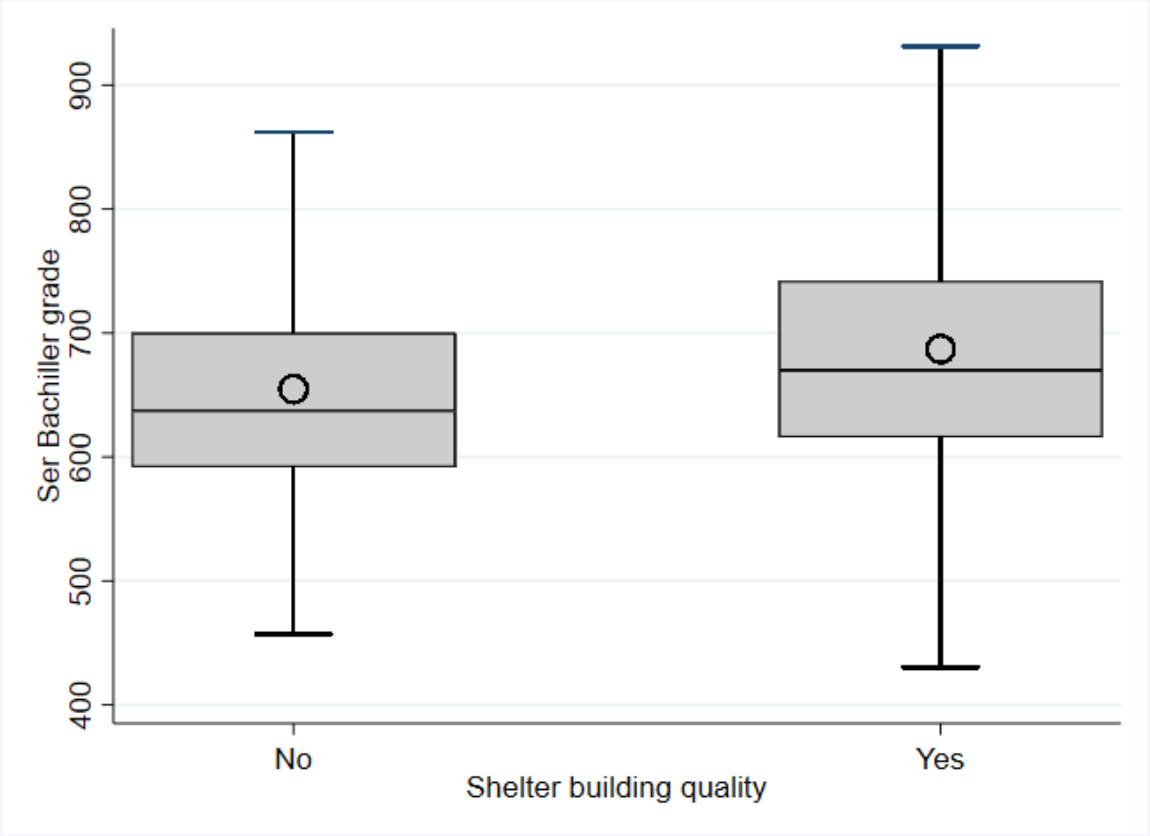
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 9. BOX GRAPH FOR *SUFFERED HUNGER BECAUSE OF INSUFFICIENT FOOD*



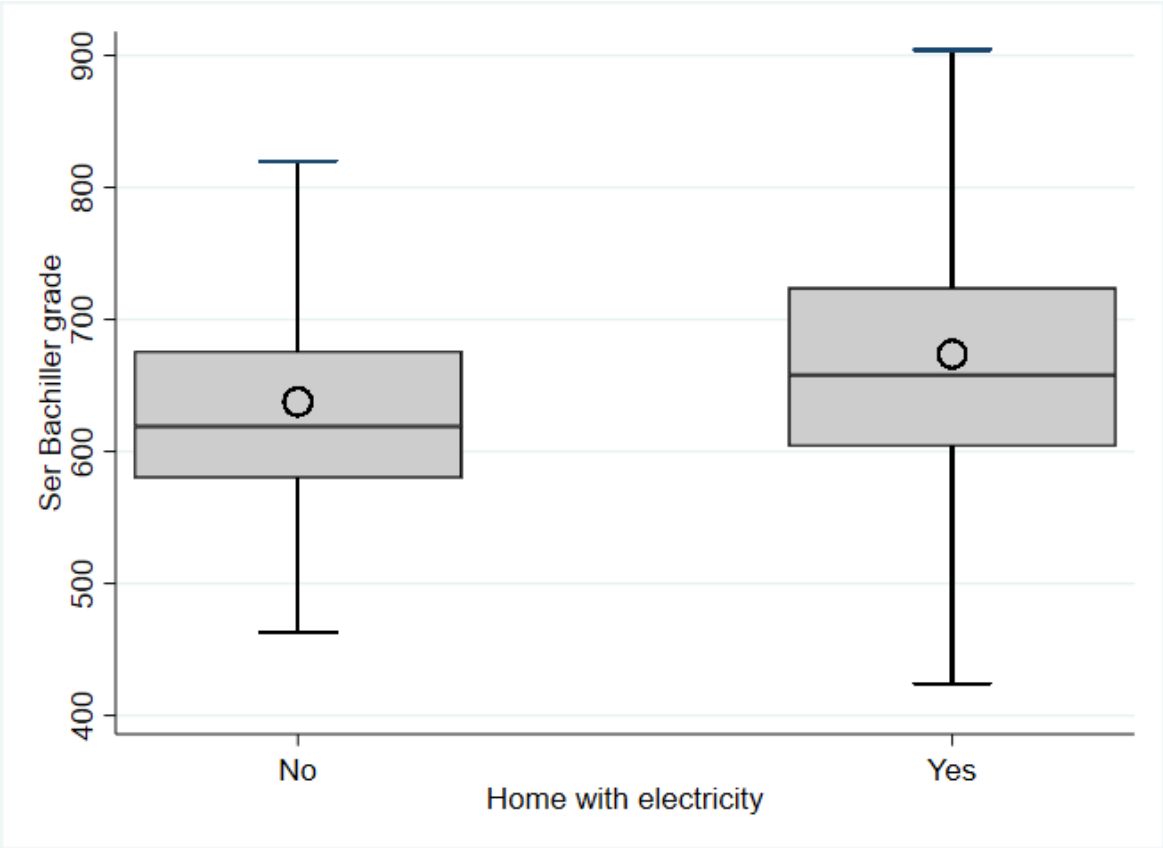
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 10. BOX GRAPH FOR *HOUSE MATERIALS (SHELTER)*



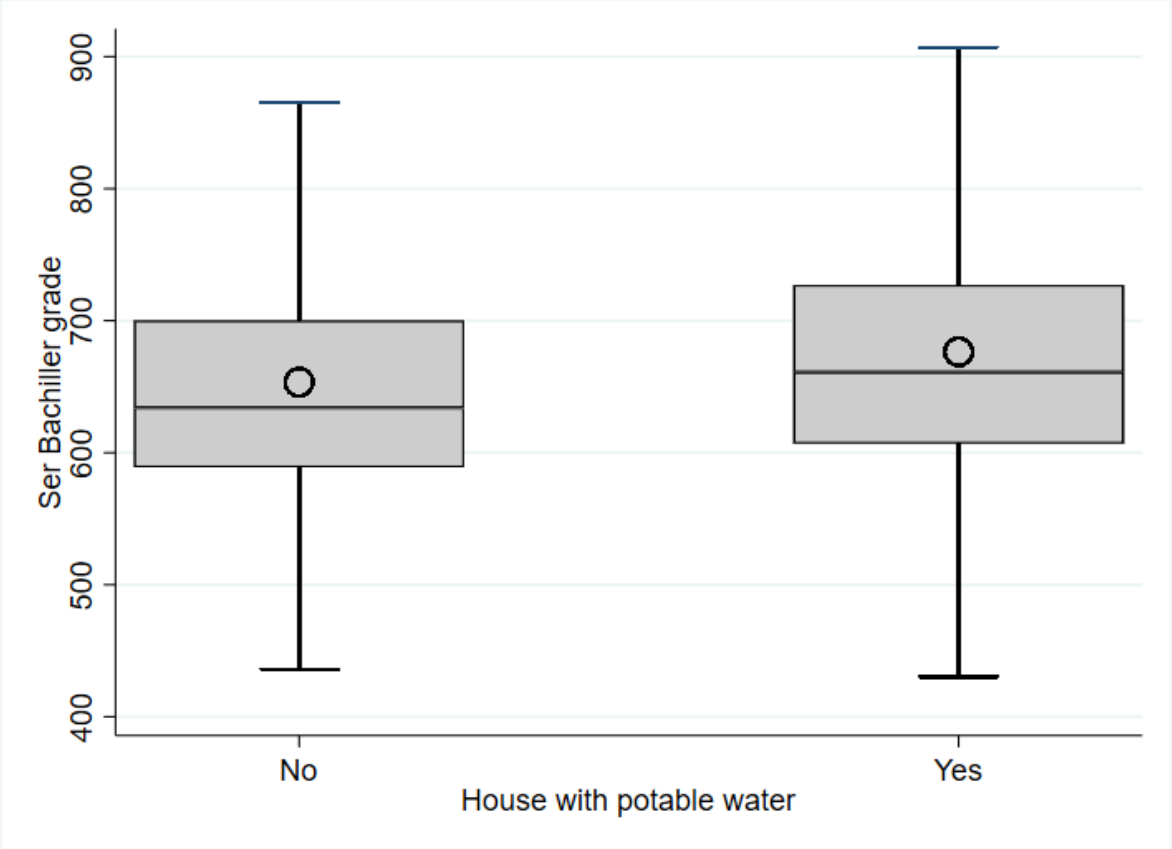
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 11. BOX GRAPH FOR *ELECTRICITY*



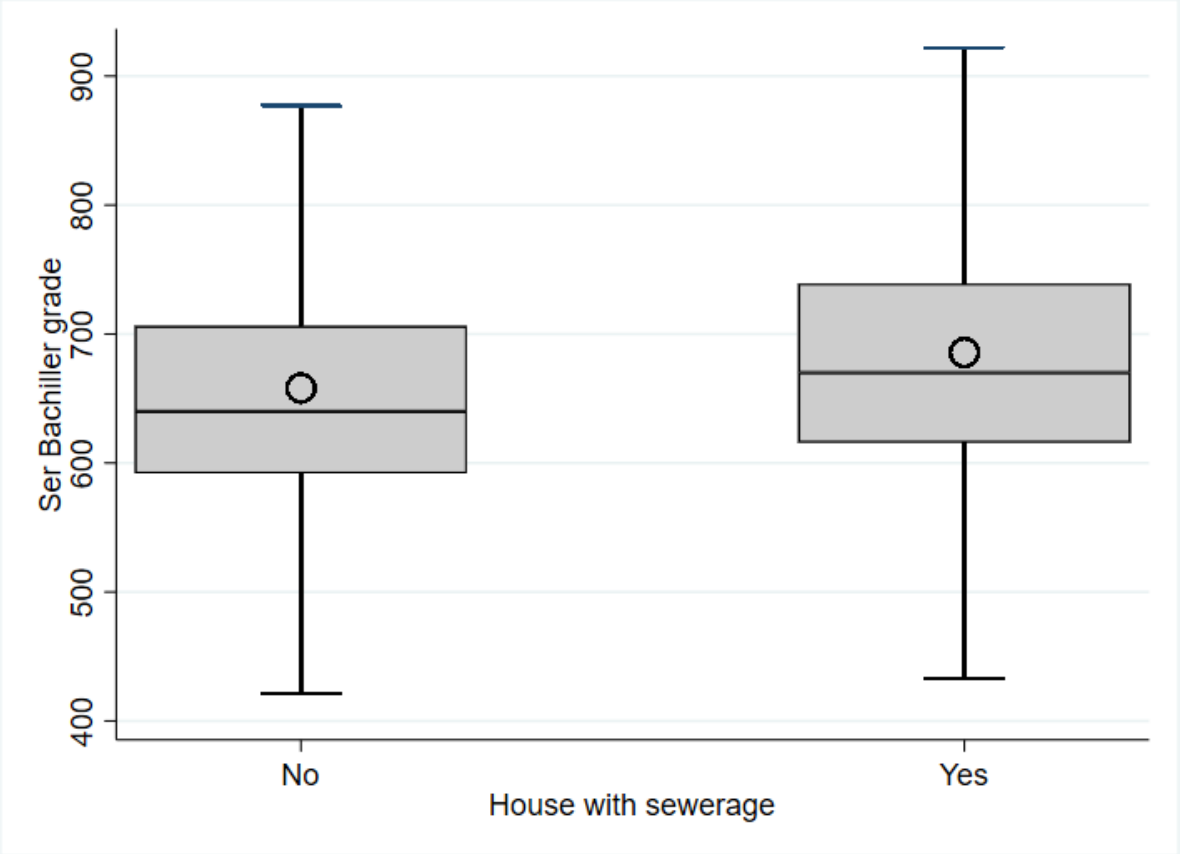
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 12. BOX GRAPH FOR *POTABLE WATER*



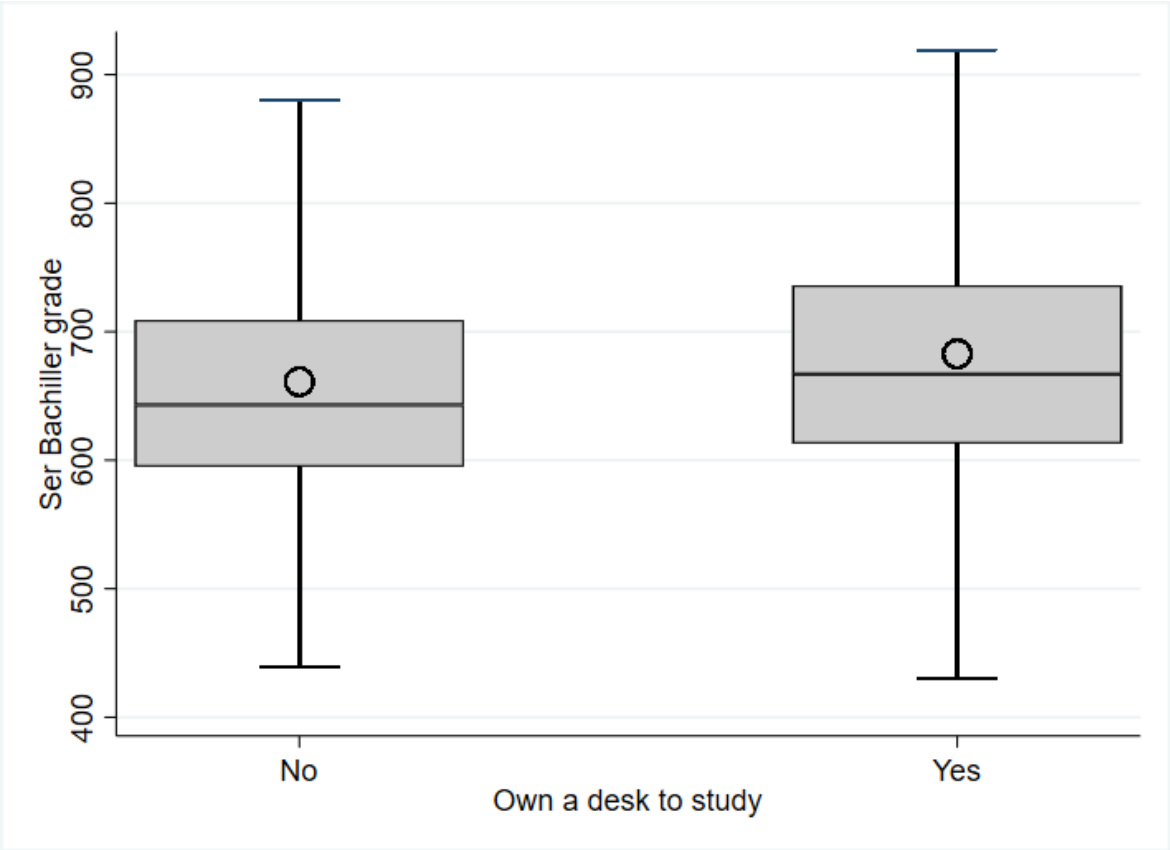
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 13. BOX GRAPH FOR *SANITARY*



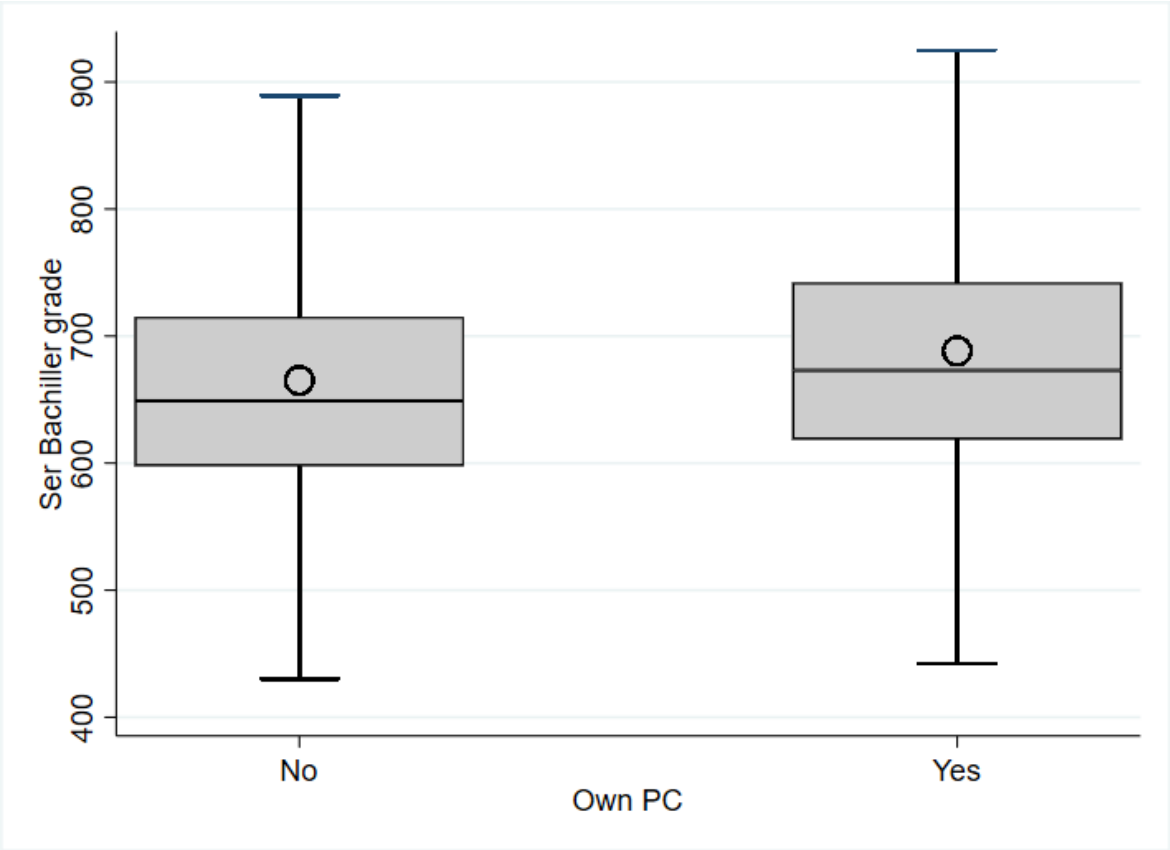
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 14. BOX GRAPH FOR *STUDYING DESK*



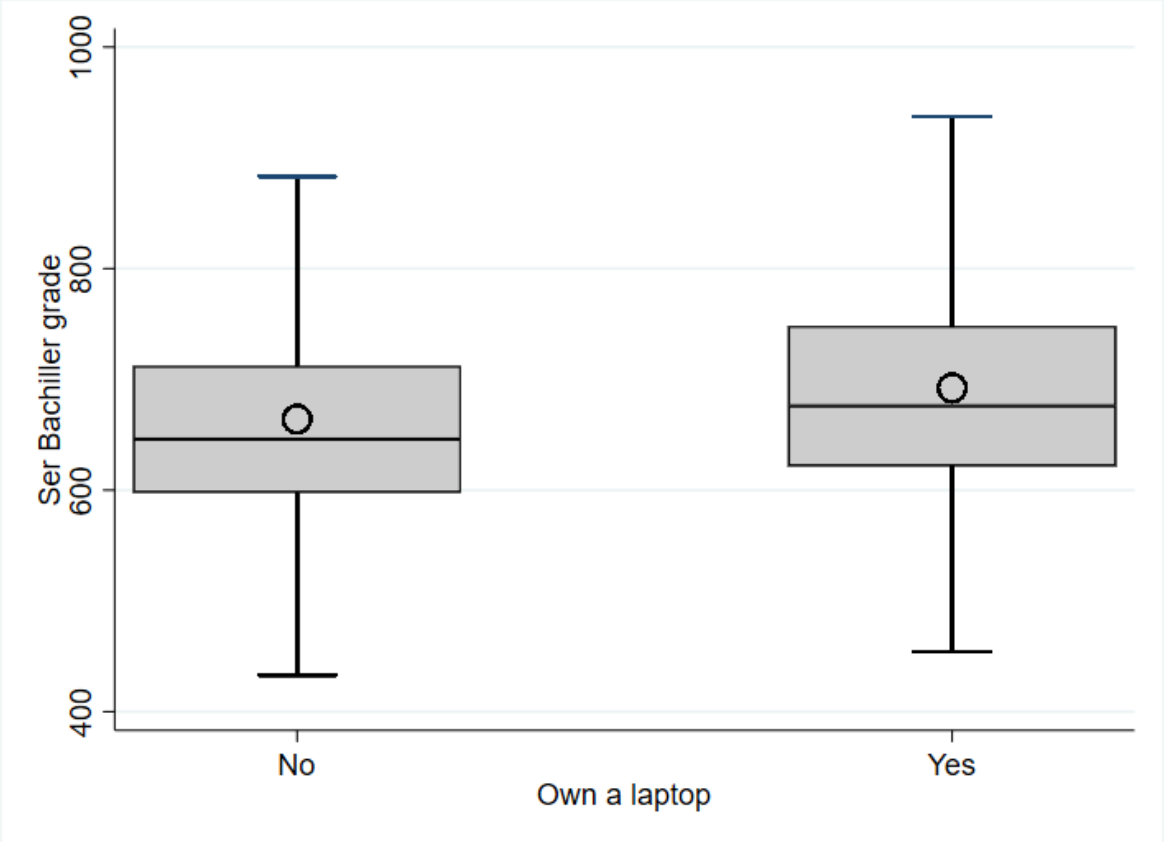
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 15. BOX GRAPH FOR *PC*



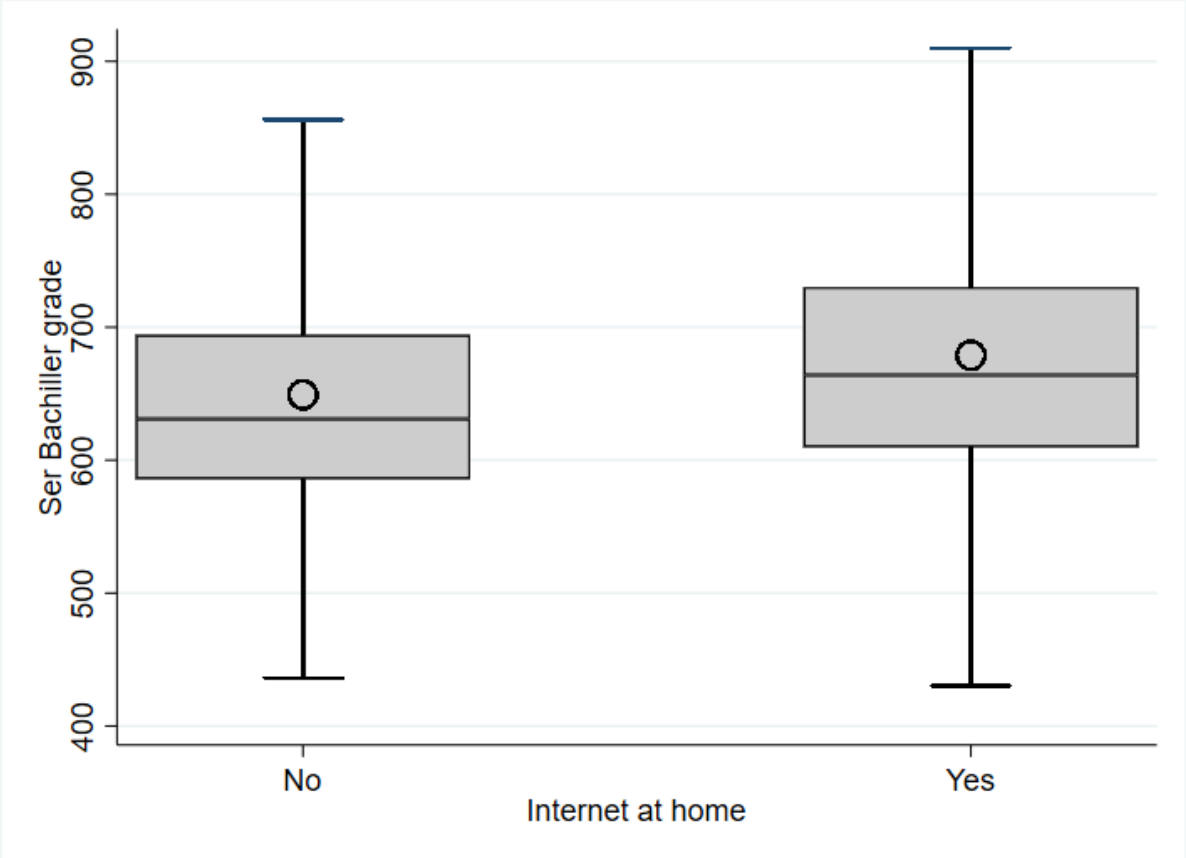
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 16. BOX GRAPH FOR *LAPTOP*



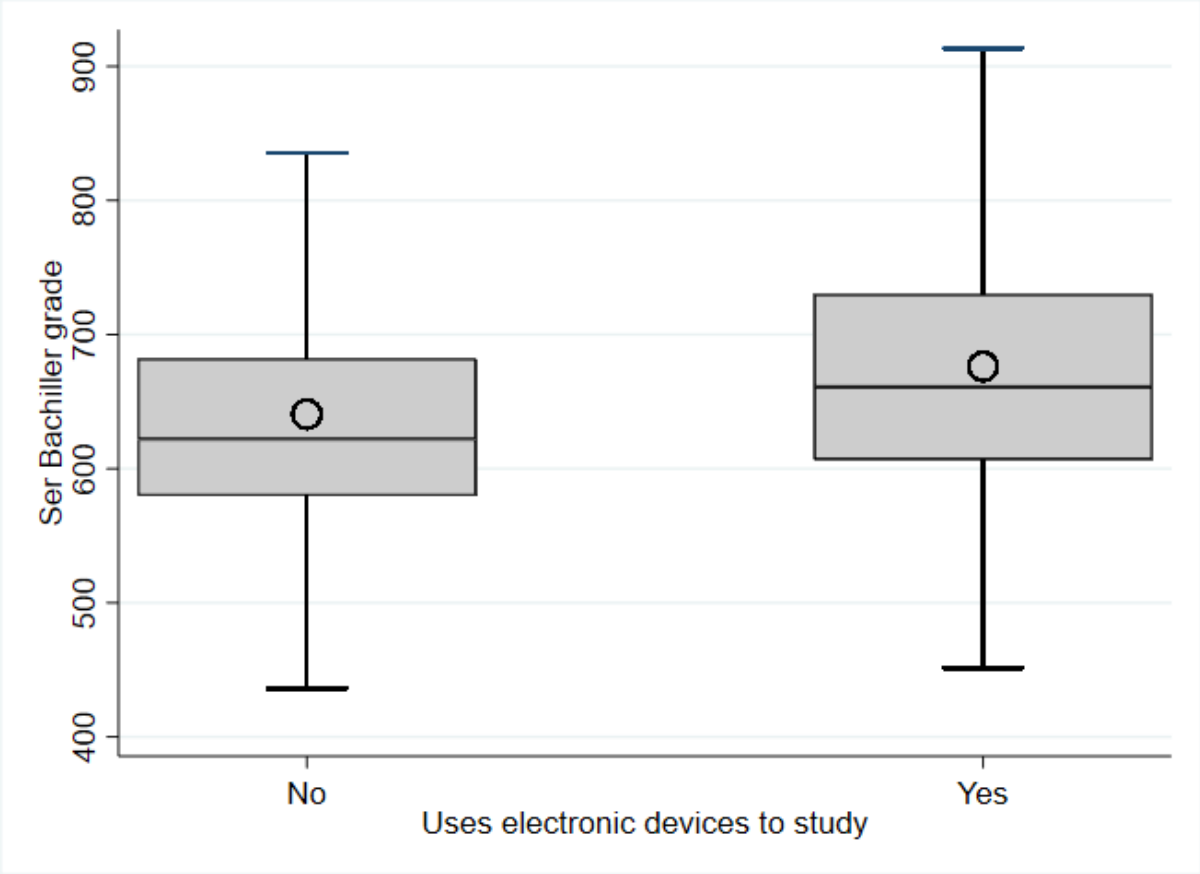
Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 17. BOX GRAPH FOR *INTERNET*



Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database

ANNEX 18. BOX GRAPH FOR *USES ELECTRONIC DEVICES TO STUDY*



Notes: A box graph shows the grade distributions in 5 levels that are calculated according to each category's own answers. The lower line of the box represents the first quartile. The middle line represents the median. The higher line represents the 3rd quartile. This circle shows the median. The top and lower vertical lines show the range of the dispersed values out of the most accumulated areas.
Source: Author's graphs using Ineval's database