Will Raising Compulsory School Attendance Reduce Dropouts?

Emmeline R. Garcia-Coles[1*]   Alma Sonia Q. Sanchez-Danday[2]
1.Mathematics Unit, Leyte Normal University, Tacloban City 6500, Philippines
2.Professional Education Unit , Leyte Normal University, Tacloban City 6500, Philippines

Abstract
An increasingly popular government initiative to achieve quality education and prevent students from dropping out of school is the raising of compulsory schooling years. Using exploratory research design, this study determined whether the duration of compulsory schooling predicts students' dropout rate. Data mining techniques were used in exploring the data sets of 90 countries worldwide. To fit the data with the appropriate model, a polynomial regression analysis was used with an acceptability level pegged at R-Sq = 85% and above. Results revealed that the increase in the number of years of compulsory education decreases the dropout rate until it reaches the saturation point of 13 years. Beyond the saturation point, dropout rate increases. The study recommends for government initiatives and interventions to improve student engagement for countries implementing compulsory schooling beyond 13 years.
Keywords: length of compulsory schooling, dropout rate, compulsory school attendance age, out-of-school youth, data mining
DOI: 10.7176/JEP/10-17-12
Publication date:June 30th 2019

1. Introduction
Countries around the world have different educational standards set forth to achieve quality education viewed to be a fundamental factor in securing economic progress. Initiatives vary from country to country to ensure that students stay in school and have a better quality of life.

An increasingly popular government initiative for quality education is raising the compulsory school attendance age. It was found that increasing the duration of compulsory education increases the students' economic returns to legitimate work, make students more risk-averse, and cause a significant decline in incarceration rates (Moretti, 2005; Lochner & Moretti, 2004). Studies also found that compulsory schooling reduces the incidence of childbearing (Black, Devereux, & Salvanes, 2008; Manlove, 1998) suggesting that a high level of school engagement has a spillover effect to adolescents' fertility decisions.

The study of Hungerman (2014) gave a different perspective, however. He found that the Canadian compulsory schooling laws which uplifted the level of education of the broader population led to the decline of religious affiliation in the country.

As to the effect of raising the compulsory attendance age to the dropout rate, studies provide varying results and perspectives. Hence, this study explored the possible relationship of the years of compulsory education and the dropout rate of secondary school-aged youth and determined whether a dropout rate pattern exists as students stay longer in school.

2. Objective of the Study
This study attempted to explore whether the length of compulsory education predicts student dropout rate.

3. Literature Review
The right to education is a top priority of the international community. The Education for All (EFA) movement lead by UNESCO (United Nation Educational, Scientific and Cultural Organization) assures that governments provide free, compulsory, and quality primary education by 2015. Despite the free and compulsory education, school attendance is still far from adequate. UNESCO (2007) reported that poverty is a key factor hindering enrolment and school completion and because of this, ethnic minority and indigenous communities' children were found to be consistent school underachievers.

Though school completion rates have grown over the years (Doll, Eslami, & Walters, 2013) brought by social movements, cultural changes, and other government initiatives, the dropout problem has still persisted (Rumberger & Thomas, 2000). Bella & Mputu (2004) analyzed the transition rate from primary to secondary education of developing and developed countries and confirmed that the causes of dropout rate are social and economic. The study of Oreopoulos, Page, and Stevens (2006) indicated that the educational attainment of the parents predicts a student's scholastic action as to whether he repeats a grade level or is at risk of dropping out from school. They noted that an increase in parental education of either parent reduces student repetition in a class by two to four percent. In a study of 832 Icelandic youth, Blondal and Adalbjarnardottir (2012) found that unexpected adolescent dropouts who were high achievers in class are prone to have negative school behaviors

and academic disinterest than those who unexpectedly graduated. Moreover, during their last year in compulsory school, males coming from the lower social economic stratum became more emotionally disengaged in school. Consequences of dropping out in school have been laid down in several studies. Oreopoulos (2003; 2007) found that students compelled to stay in school experience substantial gains to lifetime wealth, health, and labor market opportunities in the United States, Canada, and the United Kingdom. Nevertheless, adolescents tend to ignore future consequences in dropping out of school making school compulsory education a better option for them (Oreopoulos, 2007). Angrist and Keueger (1991) found that compulsory schooling laws would encourage about 25 percent of potential dropouts to stay in school. However, the results of the study of Landis & Reschly (2011) indicated that compulsory schooling years had a negligible relationship with dropout timing.

The study of Yi et al. (2012) revealed that despite the nine-year compulsory education in China, dropout rates in junior high school are still increasing. They surveyed 7,800 grades seven to nine students from 46 randomly selected junior high schools in North and Northwest China and found that the government's policy for reducing tuition fees in junior high school is not sufficient to solve the dropout issue. On the other hand, Yanqing (2012) studied the current compulsory education enrollment and dropout rates in China's least developed regions. He found that although enrollment is still low in junior middle school and dropout rates are high in some districts, the junior middle school dropout rate in impoverished districts has declined significantly due to the free compulsory education and student subsidy policy.

In the United States, Bridgeland et al. (2006) studied the reasons behind high school dropout problem using a series of focus groups and survey. They interviewed 467 ethnically and racially diverse students aged 16 to 25 among 25 different places throughout the United States. Thirty-eight percent of the respondents identified "too much freedom" and having not enough rules in high school made them drop out. The study proposed the increase of the compulsory school age attendance, specifically the legal dropout age, to lessen the dropout rate.

A policy analysis was also done by the North Central Regional Educational Laboratory (NCREL) on high school dropout age providing a general view of the challenges in increasing the compulsory attendance age from 16 to 18 years old. It found the role of schools, together with parents and the community, to play an important part in preventing students from dropping out (Bhanpuri & Reynolds, 2003). In the Netherlands, Cabus & De Witte (2011) found that the one-year increase in compulsory schooling attendance reduces dropout by 2.5% points and that secondary students would likely obtain a diploma if they stay longer in school.

On the other hand, the study of Landis and Reschly (2010) revealed that compulsory school attendance age had a small relationship with the level to which the student drops out but with no relationship with high school completion. Furthermore, they found no observable pattern of reduction in dropout rates manifested by states that raised their attendance ages. Moreover, Mackey and Duncan (2013), did not find a clear pattern of effects on dropouts, truancy, and disciplinary actions among the 11 states in the United States from increasing the compulsory school age.

4. Research Model

Figure 1. Relationship of Compulsory Education and Dropout Rate

5. Data Analysis

This study made use of exploratory research design. Data mining was used to explore the data sets from the 2013 UNESCO database available at data.uis.unesco.org and in the formulation of possible theories. These data include the duration of compulsory education among the 90 countries in the world and the rate of out-of-school youth or adolescents of secondary school age.

In analyzing the data, regression analysis was applied. The determination of the acceptability of the models was pegged at R-Sq = 85% and above. This shows how well fitted the model is for the data set.

Among the countries in the world, 90 countries have available data on the duration of compulsory education and the rate of out-of-school youth or adolescents of secondary school age for the year 2013. A graph of these 90 countries is shown in Figure 2. As shown in the scatter plot, a pattern can be observed. As the number of years of compulsory education increases, the dropout rate tends to decrease.
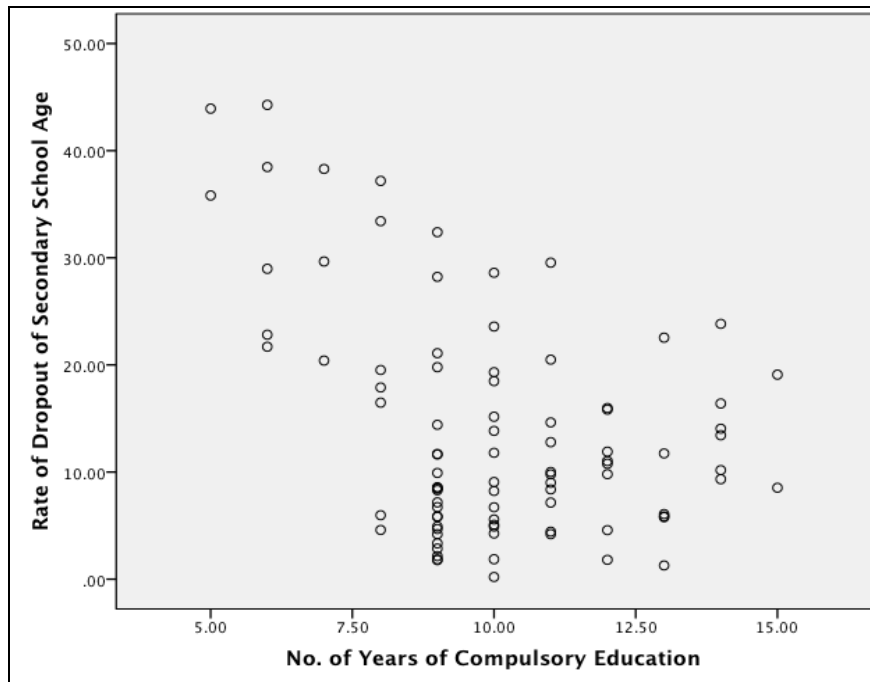
Figure 2. Scatter Plot of Compulsory Education Duration and
Dropout Rate of Secondary School Age Youth of the 90 Countries Worldwide

Figure 3 shows the scatter plot of compulsory education duration and the average dropout rate of secondary school age youth of the 90 countries worldwide. The graph shows a polynomial distribution of these variables.
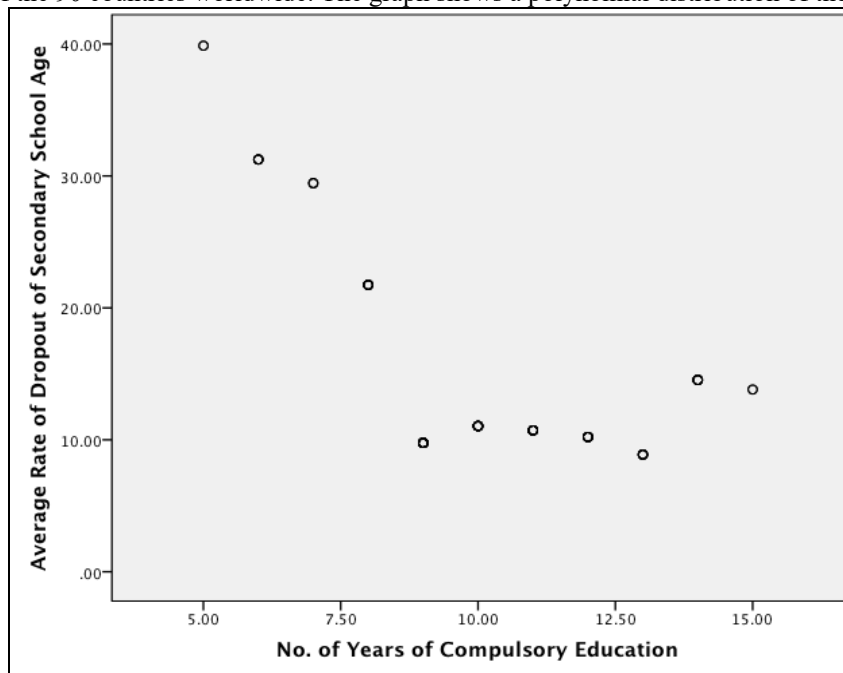

Figure 3. Scatter Plot of Compulsory Education Duration and the Average
Dropout Rate of Secondary School Age Youth of the 90 Countries Worldwide

To fit the data with the appropriate model, a polynomial regression analysis was used. Table 1 gives a summary of the different polynomial models that possibly fit the relationship between the compulsory education duration and the dropout rate. A component had to be statistically significant at .05 level and account for at least 3% of the variance of the dropout rate to be retained in the final model,. The model adopted was the quadratic model (significant at $p<0.01$),

Average Dropout Rate = 110.325 – 17.771 No. of Years of Compulsory Education
+ 0.775 (No. of Years of Compulsory Education)^2

Table 1. Model Summary of Compulsory Education Duration
and the Average Dropout Rate of Secondary School Age Youth

Model	R	R Square	Change Statistics				
			R Square Change	F Change	df1	df2	Sig. F Change
Linear	.622[a]	.387	.387	54.925	1	87	.000
Quadratic	.935[b]	.874	.487	332.342	1	86	.000
Cubic	.939[c]	.881	.007	5.191	1	85	.025

Predictors: (Constant), No. of Years of Compulsory Education[a]

Predictors: (Constant), No. of Years of Compulsory Education, (No. of Years of Compulsory Education)^2[b]

Predictors: (Constant), No. of Years of Compulsory Education, (No. of Years of Compulsory Education)^2,

(No. of Years of Compulsory Education)^3[c]

The analysis of variance shown in Table 2 reveals a significant relationship between the model and the response variable (i.e. the dropout rate) at $p<0.01$. This implies that the number of years of compulsory education predicts the dropout rate.

Table 2. Analysis of Variance for Compulsory Education Duration and the
Average Dropout Rate of Secondary School Age Youth of the 90 Countries Worldwide

Analysis of Variance					
Quadratic	DF	Sum of Squares	Mean Square	F	Sig.
Regression	2	4296.304	2148.152	298.226	0.000
Residual Error	86	619.466	7.203		
Total	88	4915.770			

6. Discussion

The UNESCO database shows that the duration of compulsory education worldwide ranges from five to 15 years. The shortest duration is imposed by the Lao People's Democratic Republic and Bangladesh which has a five-year compulsory education. Five countries including Benin, Comoros, Jamaica, Sao Tome & Principe, and Suriname impose a six-year compulsory education. Eswatini, Lesotho, and Zimbabwe's compulsory education last for seven years. The countries with an eight-year duration are Belize, Croatia, India, Iran, Malawi, Serbia, and Tonga. Twenty-three countries have a nine-year duration. These include Albania, Bahrain, Belarus, Brunei Darussalam, China (Hong Kong Special Administrative Region), Cuba, Estonia, Georgia, Greece, Indonesia, Japan, Kazakhstan, Kuwait, Lithuania, Poland, Portugal, Qatar, Republic of Korea, Republic of Moldova, Saudi Arabia, Slovenia, Sweden, and Timor-Leste. Azerbaijan, Canada, Cabo Verde, China (Macao Special Administrative Region), Colombia, Cyprus, Denmark, France, Iceland, Jordan, New Zealand, Norway, Palestine, Saint Lucia, Seychelles, and Spain are among the 16 countries with a 10-year duration. The countries imposing 11 years for their compulsory education are Bulgaria, Cook Islands, Ghana, Hungary, Latvia, Malta, Panama, Philippines, Switzerland, Ukraine, and United Kingdom of Great Britain and Northern Ireland. Eight countries have a duration of 12 years which include Belgium, El Salvador, Grenada, Italy, Luxembourg, Saint Vincent and the Grenadines, Turkey, and Uzbekistan. Argentina, Costa Rica, Israel, Puerto Rico, and the United States of America have a duration of 13 years while Bolivia, Brazil, Mexico, Peru, Uruguay, and Venezuela have a duration of 14 years. Lastly, the Dominican Republic and Ecuador have a duration of 15 years.

The results show that the dropout rate decreases as the duration of compulsory education increases. This pattern continues for a period of five to nine years. From nine to 13 years, the dropout rates slightly change and at 14 and 15 years, the dropout rates gradually increase.

This pattern reveals that a longer duration of compulsory schooling decreases student dropout rate until it reaches a saturation point of 13 years. The trend implies a gradual rise in the dropout rate thereafter. This supports the findings of Blondal and Adalbjarnardottir (2012) that most students become emotionally disengaged during the last years of compulsory education.

7. Conclusion and Recommendations

The duration of compulsory education imposed by countries worldwide can predict students' dropout rate.

The results imply that imposing longer compulsory education among the countries prevents secondary students from dropping out of school. Nevertheless, once these students reach the saturation point of 13 years, they start losing interest in their studies and consequently dropout. Several factors contributing to this trend could be a focus of further studies.

Initiatives to help reduce dropout rates after 13 years of compulsory education should be made such as the provision of flexible schooling hours and systems, multi-grade teaching, and multi-age teaching approaches and materials (Sabates, Westbrook, Akyeampong, & Hunt, 2010). Schools should also be equipped with motivational resources to make students stay. Hardre and Reeve (2003) found that high school students' self-determined motivation and perceived competence could be predicted by the autonomy support given to them in the classroom which includes motivational resources.

This study is perceived to guide the government, curriculum-makers, and lawmakers around the world in drafting and modifying laws in imposing compulsory education. Likewise, countries implementing compulsory education beyond 13 years are encouraged to provide interventions in fostering expectations and engagement to maintain the academic interest of the students.

References

Angrist, J. D., & Keueger, A. B. (1991), "Does Compulsory School Attendance Affect Schooling and Earnings?", *The Quarterly Journal of Economics*, *106*(4), 979-1014.

Bella, N., & Mputu, H. (2004), "Dropout in Primary and Secondary School: A Global Issue and an Obstacle to the Achievement of the Education for All Goals", *International Journal on School Disaffection*, *2*(2), 14-30.

Bhanpuri, H., & Reynolds, G. M. (2003), "Understanding and Addressing the Issue of the High School Dropout Age", *Learning Point Associates*.

Black, S. E., Devereux, P. J., & Salvanes, K. G. (2008), "Staying in the Classroom and Out of the Maternity Ward? The Effect of Compulsory Schooling Laws on Teenage Births", *The economic journal*, *118*(530), 1025-1054.

Blondal, K. S., & Adalbjarnardottir, S. (2012), "Student Disengagement in Relation to Expected and Unexpected Educational Pathways", *Scandinavian Journal of Educational Research*, *56*(1), 85-100.

Bridgeland, J. M., DiIulio, J. J., Morison, K. B., Civic, E., & Peter D. Hart Research, A. (2006). The Silent Epidemic: Perspectives of High School Dropouts.

Cabus, S. J., & De Witte, K. (2011), "Does School Time Matter? On the Impact of Compulsory Education Age on School Dropout", *Economics of Education Review*, *30*(6), 1384-1398.

Doll, J. J., Eslami, Z., & Walters, L. (2013), "Understanding Why Students Drop Out of High School, According to Their Own Reports: Are They Pushed or Pulled, or Do They Fall Out? A Comparative Analysis of Seven Nationally Representative Studies", *Sage Open*, *3*(4), 2158244013503834.

Hardre, P. L., & Reeve, J. (2003), "A Motivational Model of Rural Students' Intentions to Persist in, versus Drop Out of High School", *Journal of educational psychology*, *95*(2), 347.

Hungerman, D. M. (2014), "The Effect of Education on Religion: Evidence from Compulsory Schooling Laws", *Journal of Economic Behavior & Organization*, *104*, 52-63.

Landis, R. N., & Reschly, A. L. (2010), "An Examination of Compulsory School Attendance Ages and High School Dropout and Completion", *Educational Policy*, 25(5), 719 – 761.

Lochner, L., & Moretti, E. (2004), "The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-reports", *American economic review*, *94*(1), 155-189.

Mackey, P. E., & Duncan, T. G. (2013), "Does Raising the State Compulsory School Attendance Age Achieve the Intended Outcomes?", REL 2014-005. *Regional Educational Laboratory Mid-Atlantic*.

Manlove, J. (1998), "The Influence of High School Dropout and School Disengagement on the Risk of School-Age Pregnancy", *Journal of research on adolescence*, *8*(2), 187-220.

Moretti, E. (2005, October), "Does Education Reduce Participation in Criminal Activities", In *Symposium on Social Costs of Inadequate Education, Teachers' College, Columbia University*.

Oreopoulos, P. (2003), *Do dropouts drop out too soon? International evidence from changes in school-leaving laws* (No. w10155), National Bureau of Economic Research.

Oreopoulos, P. (2007), "Do Dropouts Drop Out Too Soon? Wealth, Health and Happiness from Compulsory Schooling", *Journal of public Economics*, *91*(11-12), 2213-2229.

Oreopoulos, P., Page, M. E., & Stevens, A. H. (2006), "The Intergenerational Effects of Compulsory Schooling", *Journal of Labor Economics*, *24*(4), 729-760.

Rumberger, R., Thomas, S. (2000), "The Distribution of Dropout and Turnover Rates Among Urban and Suburban High Schools", *Sociology of Education*, 73, 39-67.

Sabates, R., Westbrook, J., Akyeampong, K., & Hunt, F. (2010). School dropout: Patterns, causes, changes and policies.

UNESCO. (2007), *A human rights-based approach to education for all,* Available: http://unesdoc.unesco.org/images/0015/001548/154861e.pdf

Yanqing, D. (2012), "The Problems with Access to Compulsory Education in China and the Effects of the Policy of Direct Subsidies to Students: An Empirical Study Based on a Small Sample", *Chinese Education and Society*, *45*(1), 13-21.

Yi, H., Zhang, L., Luo, R., Shi, Y., Mo, D., Chen, X., & ... Rozelle, S. (2012), "Dropping Out: Why are Students Leaving Junior High in China's Poor Rural Areas?", *International Journal of Educational Development*, *32*(4), 555-563.