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Article

Educational Level in the Philippines: Social Survey with Factor Analysis

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Abstract: The Philippines is a multi-ethnic and multi-cultural country with a long history of twists and turns. It attaches great importance to basic education. Its education system has inherited the American education system and method, and the social development of the education system is worth studying. By using the factor analysis method, we analyzed the educational level of the Philippines. The factors affecting the social development were related to population growth rate, sexuality, employment rate, and economic situation, among which the subsidy from the social security system was the most important. The consistency in the social development was far greater than the difference in higher education development.

Keywords: SPPS analysis, Data analysis, Social and economy

1. Introduction

With the advent of technology in the latest revolutionary advances (such as bioengineering, nanotechnology, globalization, etc.), we have the new era of humanity. Big data brings a subversive technological change in the informatinon technology industry with cloud computing and the Internet of Things. This has been driven by China's "One Belt, One Road" policy. On April 25, 2019, Chinese President Xi Jinping met with Philippine President Duterte at the Great Hall of the People in Beijing (Wu, 2016). Duterte said that the Philippines, as one of the ASEAN member states, actively respond to the "One Belt, One Road" initiative and seek mutual benefit and win-win development with China (Wang 2019). Thus, it is worth researching and analyzing the impact of China on the education and economic development in the Philippines is necessary (Cao, 2007).

2. Data and Method

All data in this article was based on Philippine Statistical Yearbook (PSY), Chinese National Bureau of Statistics, and obtained from the Philippine doctoral class (Philippine Statistics Authority 2019).

The total population of the Philippines was 106 million. According to the survey in January 1st, 2019, the number of births per day in the Philippines was 6625, and that of deaths per day in the Philippines was 1895. Thus, the annual increase of the population is estimated to be 975 thousand. There is one birth every 13 seconds, and one death every 46 seconds. The main causes of death of the Philippines were coronary heart disease, stroke, Influenza, and Pneumonia (Li, 2013). Results from the 2019 Labor Force Survey in the Philippines showed that the employment rate was 62.2% which increased from 60.7% in 2017 years. The unemployment rate (%) was 18.0% which was higher than 16.3 in 2017 (Li, 2019). Filipino's literacy rates were about 96.29%, the male adult's rate was 95.78% while that of adult females was 96.79%. Only 1.1 million people were illiterate. In addition, youth literacy rates were 96.98% for males and 98.94% for females.

The Philippine Constitution stipulated compulsory education in primary and secondary schools. The government attaches importance to education encouraged private schools, provides long-term low-interest loans to private schools, and exempts property taxes. Primary and secondary education is mainly based on government education. By December 2018, there were 50,483 primary schools in the country, including 11,680 private schools. There were 14,217 secondary schools, of which 5,935 were private. There were 107 state colleges and universities, most of which were private. Famous universities include the University of the Philippines, the University of De La Salle, the Ateneo University, the University of the East, the University of Far East, and the University of St. Thomas (Yang, 2015).

In recent years, the Philippine government has emphasized national education and has allocated funds for school education from the fiscal year. Budgetary appropriation for the Philippine educational system by the level of education from FY 2007 to FY 2014 was shown in Fig. 1.

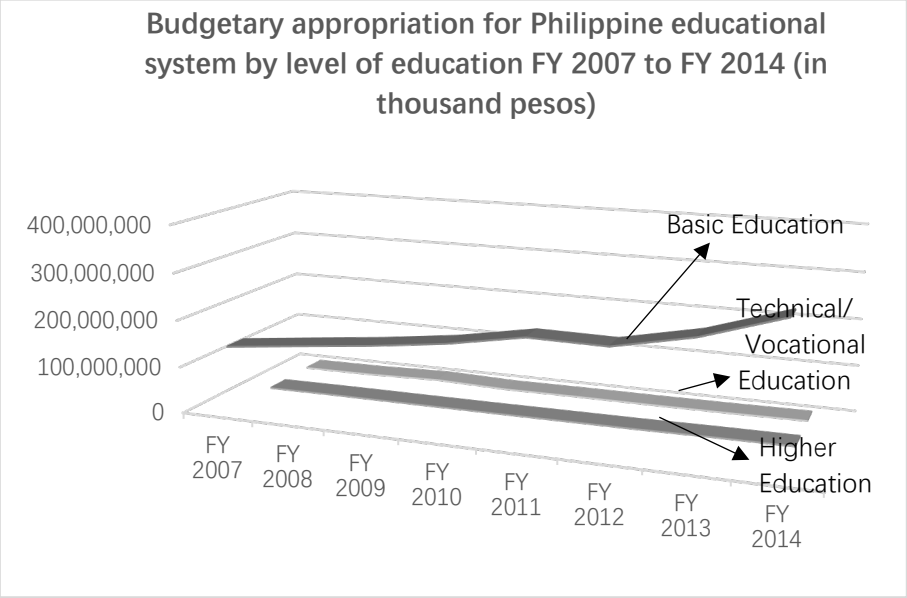

Fig. 1. Budgetary Appropriation for Philippine Educational System by the level of education FY 2007 to FY 2014.

Fig 1 shows the Philippine government's financial investment in basic education was much higher than that in higher education and technical/vocational education. The financial investment in technical/vocational education was higher than that in higher education. The annual growth rate of financial investment in technical/vocational education was small, almost parallel to the annual growth rate of that in higher education. However, the annual growth rate of financial investment in basic education had increased significantly since 2012. It signified that the Philippine government paid more attention to the popularization of basic education (Yang 2019).

3. Results

The data from the Philippine Social Survey for the ten years from 2007 to 2016 were analyzed with SPSS (Statistical Product and Service Solutions) software. 15 variables were set as “Year”, “Pre-school Enrollment”, “Elementary Enrollment”, “Secondary Enrollment”, “Higher Education Enrollment”, “Per Capita GDP (Gross Domestic Product)”, “Per Capita Gross National Income”, “Per Capita Household Final Consumption Expenditure”, “Population Growth Rate”, “Registered Filipino Emigrants”, “Sex Ratio” “Employment Rate”, “Peso Per Dollar Exchange Rate”, “Revenues of the Social Security System by Fund”, “Expenditures of the Social Security System by Fund”. Among them, “Year” was a string variable, and the rest were numerical variables. The factor analysis was used to analyze the educational level of the Philippines. The impact factors included population growth rate, sexuality, employment rate, economic situation, etc. Then the statistical analysis of SPSS software was used to simulate the educational level of China and that of the Philippines (Wang, 2004).

3.1. Statistical Analysis of Education Level in the Philippines

3.1.1. Correlation Analysis

A simple correlation analysis of the Philippine preschool enrollment, elementary enrollment, and secondary enrollment was performed (Yang 2013). Under the premise of controlling the Philippine higher education enrollment, a partial correlation analysis of preschool enrollment, elementary enrollment, and secondary enrollment was conducted. As shown in Table 1, the correlation between elementary enrollment and pre-school enrollment was significant at the 0.01 level (2-tailed), while that between secondary enrollment and pre-school enrollment was significant at the 0.05 level (2-tailed). Table 2 presents tha the partial correlation between elementary and pre-school enrollments was significant at the 0.01 level (2-tailed), while that between secondary enrollment and

pre-school enrollment was not significant. It demonstrates that higher education enrollment was obviously influenced by elementary enrollment and pre-school enrollment.

Table 1. Correlations from bivariate analysis

		Pre-School	Secondary	Elementary
Pre-School	Pearson Correlation	1	0.763*	0.989**
	Sig. (2-tailed)		0.010	0.000
	N	10	10	10
Secondary	Pearson Correlation	0.763*	1	0.713*
	Sig. (2-tailed)	0.010		0.021
	N	10	10	10
Elementary	Pearson Correlation	0.989**	.713*	1
	Sig. (2-tailed)	0.000	.021	
	N	10	10	10

Table 2. Correlations from partial correlation analysis

Control Variables		Pre-School	Elementary	Secondary
Higher Education	Pre-School	1.000	0.983**	0.320
	Elementary	0.983**	1.000	0.287
	Secondary	0.320	0.287	1.000

3.1.2. Regression Analysis

In regression analysis, “Higher Education Enrollment” was the dependent variable, and “Per Capita GDP”, “Per Capita Gross National Income”, “Per Capita Household Final Consumption Expenditure”, “Population Growth Rate”, “Registered Filipino Emigrants”, “Sex Ratio” “Employment Rate”, “ Peso Per Dollar Exchange Rate ”, “Revenues of the Social Security System by Fund”, “Expenditures of the Social Security System by Fund” were independent variables, and then stepwise multiple linear regressions were performed. The results are shown in Tables 3 to 5. The linear relationship between the dependent variable “higher education enrollment” and independent variables was not obvious except the “revenues of the social security system by fund”.

Table 3. Variables entered/removed

Model	Variables Entered	Variables Removed	Method
1	Revenues of the Social Security System by Fund		Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).

Table 4. Anova[a]

Model		Sum of Squares	df	F	Sig.
1	Regression	20953916656191.027	1	30.715	0.001[b]
	Residual	5457650611757.370	8		
	Total	26411567267948.400	9		

a. Dependent Variable: Higher Education
b. Predictors: (Constant), Revenues of the Social Security System by Fund

Table 5. Excluded variables

Model	Beta In	t	Sig.	Partial Correlation
Per capita Gross Domestic Product	-0.226	-0.970	0.364	-0.344
Per capita Gross National Income	-0.223	-0.941	0.378	-0.335
Per capita House Hold Final Consumption Expenditure	-0.226	-0.969	0.365	-0.344
Population Growth Rate	0.587	1.022	0.341	0.360
Registered Filipino Emigrants	-0.126	-0.607	0.563	-0.223
Sex Ratio	-0.020	-0.076	0.941	-0.029
Employment Rate	-0.408	-1.247	0.252	-0.426
Peso Per Dollar Exchange Rate	-0.202	-1.313	0.231	-0.444
Expenditures of The Social Security System By Fund	-1.182	-2.169	0.067	-0.634

3.1.3. Further Analysis

"Total Enrollment" (the enrollment of all schools) to pre-school, elementary, secondary, and higher education was related to the independent variables mentioned above. As shown in Tables 6 to 9, the correlation between total enrollment and revenues of the social security system by fund, population growth rate, and the sex ratio was significant at the 0.01 level (2-tailed), while that between total enrollment and employment rate was significant at the 0.05 level (2-tailed). The correlation between total enrollment and different independent variables was as follows: revenues of the social security system by fund> population growth rate> sex ratio> employment rate.

Table 6. First correlations

		Total Enrollment	Revenues of the Social Security System by Fund
Total Enrollment	Pearson Correlation	1	0.910**
	Sig. (2-tailed)		0.000
	N	10	10
Revenues Of the Social Security System By Fund	Pearson Correlation	0.910**	1
	Sig. (2-tailed)	0.000	
	N	10	10

Table 7. Second correlations

		Total Enrollment	Population Growth Rate
Total Enrollment	Pearson Correlation	1	-0.871**
	Sig. (2-tailed)		0.001
	N	10	10
Population Growth	Pearson Correlation	-0.871**	1
	Sig. (2-tailed)	0.001	

Rate	N	10	10

Table 8. Third correlations

		Total Enrollment	Sex Ratio
Total Enrollment	Pearson Correlation	1	0.788**
	Sig. (2-tailed)		0.007
	N	10	10
Sex Ratio	Pearson Correlation	0.788**	1
	Sig. (2-tailed)	0.007	
	N	10	10

Table 9. Fourth correlations

		Total Enrollment	Employment Rate
Total Enrollment	Pearson Correlation	1	0.664*
	Sig. (2-tailed)		0.036
	N	10	10
Employment Rate	Pearson Correlation	0.664*	1
	Sig. (2-tailed)	0.036	
	N	10	10

3.2. Correlation Analysis of Comparison Model

The Chinese per capita GDP and that of the Philippines, the annual Chinese higher education enrollment, and that of the Philippines from 2007 to 2016 were correlation analyzed. The results were shown in Table 10. The correlation between Chinese higher education and Chinese per capita GDP was 0.972 which was close to 1 at the significant level of 0.000 (2-tailed). Therefore, the correlation between Chinese higher education and Chinese per capita GDP was significant. However, the significant level (2-tailed) of the correlation between Philippine higher education and Philippine per capita GDP was 0.111 which was much higher than 0.05. Thus, the correlation was insignificant. It implied that the Chinese government paid more attention to the development of higher education and promoted the development of the economy while improving the level of higher education, but what it was the Philippine government that neglected it.

Table 10. Correlations between higher education and GDP

		Chinese Higher Education	Chinese Per capita GDP
Chinese Higher Education	Pearson Correlation	1	0.972**
	Sig. (2-tailed)		0.000
	N	10	10
Chinese Per capita GDP	Pearson Correlation	0.972**	1
	Sig. (2-tailed)	0.000	
	N	10	10
Philippine Higher Education	Pearson Correlation	0.817**	0.896**
	Sig. (2-tailed)	0.004	0.000
	N	10	10
Philippine Per capita GDP	Pearson Correlation	0.621	0.674*
	Sig. (2-tailed)	0.055	0.033
	N	10	10
		Philippine Higher Education	**Philippine Per capita GDP**
Chinese Higher Education	Pearson Correlation	0.817**	0.621
	Sig. (2-tailed)	0.004	0.055
	N	10	10

Table 10. *cont.*

Chinese Per capita GDP	Pearson Correlation	0.896**	0.674**
	Sig. (2-tailed)	0.000	0.033
	N	10	10
Philippine Higher Education	Pearson Correlation	1	0.535**
	Sig. (2-tailed)		0.111
	N	10	10
Philippine Per capita GDP	Pearson Correlation	.535	1
	Sig. (2-tailed)	.111	
	N	10	10

4. Discussion

The Philippines attaches great importance to basic education. The Philippine government's financial investment in basic education was much higher than that in higher education and technical/vocational education. A higher education enrollment was influenced by elementary enrollment and pre-school enrollment. The linear relationship between the dependent variable "higher education enrollment" and independent variables was not obvious except for the "revenues of the social security system by fund". The correlation between total enrollment and different independent variables was as follows: revenues of the social security system by fund> population growth rate> sex ratio> employment rate. Yet, the Chinese government paid more attention to the development of higher education and promoted the development of the economy while improving the level of higher education, but the Philippine government had neglected it. In-depth development of economic and trade cooperation between the Philippines and China had driven the economic development of the Philippines. However, the consistency in social development was greater than that in higher education development. Due to the large gap between the rich and the poor in the Philippines and the insufficient government funding, it was not common for Filipinos to receive higher education. It was recommended that the Philippines could learn from China to attach importance to education and technology, and China could learn from the Philippines to internationalize.

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