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The Extent of Impact of Different Factors on Female Education in Developed and Developing Countries

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Table

Abstract

Female education is more than a blessing to every nation as female citizens play a significant role in nation's economic prosperity. But the real scenario is women are facing obstacles in getting education even in 21st century which is referred to gender discrimination in education. Several socioeconomic factors affect female education in developed and developing countries. This paper explains the extent of impact of different factors on female education in both developed and developing countries. Five variables have been used to conduct this study where female education is the endogenous variable and it can be explained by some exogenous variable like per capita GDP growth rate, poverty headcount ratio, government expenditure on education and female labor force participation rate. Statistical analysis has been done by using STATA to know the extent of these variables' impact on female education. The study concluded that labor force participation rate of female has the significant impact on education in both developed and developing countries while other variables have almost similar impact on female education. Per capita GDP growth rate was the weakest variable for developing countries and poverty headcount ratio was the weakest variable for developed countries.

Keywords: *Female Education, Gender Discrimination, Economic Prosperity, Socioeconomic Factors, Developing Countries, Developed Countries.*

Introduction:

Gender inequality is a common word that indicates an unequal treatment between male and female. Gender inequality is happening across the world's different cultures in a different manner. Women are experiencing inequality in education, politics, work place, family, property, income and many other sectors which is a curse to our society.

Female education is a blessing to every country but the real scenario is girls face obstacles to get education every day. Poverty, religion, culture, politics act as the grounds of the barriers to female education. Gender inequality in education is a vital problem in both developed and developing countries that interrupts a country's development in terms of income, human development, technological progress, GDP, welfare and so many things. There are many socioeconomic factors like poverty, social norms, less opportunities, poor health conditions that affect female education and as a result women are not getting adequate education. But female education is very important for every country as it accelerates a country's economy. Uneducated women cannot contribute to her family and nation much, on the other hand educated women is like a blessing to her family and nation.

In developing countries, 25% girls are not able to finish primary education among all girls (UNESCO 2013). There are 774 million illiterate people in developing countries and among them two-third are women (UNESCO 2013).

Among all factors, poverty triggers female education the most. 7-16 years old girls do not ever go to school in Somalia which is a developing country. Undoubtedly in education sector across the world this is the highest inequality. However, gender equality in primary and as well as secondary education has been achieved by Bangladesh tremendously. Bangladesh has successfully brought about this gender parity by using stipends, tuition fee waiver and many other public interventions.

Female participation rate in education has been increased in modern era but it is still lower than male participation rate. Women are facing inequalities in education yet. But this is not acceptable on 21st century. From this situation a very crucial question has been raised: "When will people understand the importance of female education?" A country's economic prosperity is somehow linked with female education. If a country's almost 50% of the total population is female, and if they are uneducated, the country cannot go very far with its other half population who are educated male. So discussing gender disparity in education is very critical as it hampers an

economy's productivity. As a result, we have to concentrate on the factors that affect female participation in education. And we have to find out the extent of the effect of different factors on female participation in education. Thus we can easily remove the barriers to female education that can help to get a productive and developed economy.

There is a clear view in front of us that developed countries have less gender disparity in education compared to developing countries because of higher income, less poverty rate, better health condition, more social awareness and so many things. Primary education should be the main focus of less developed countries. When the country can maximize its returns from the primary education, it should focus on secondary education and then higher education.

Extensive importance of female education provides the objective of the study to analyze the extent of impacts of different factors on female education in both developed and developing countries. So the study includes to analyze the condition of female education in both developed and developing countries and to concentrate on some important factors that affect female participation in education. Eventually the regression model will let us know the extent of impacts of different factors.

Literature Review:

McWhirter, E. H (1997) conducted a paper named **Perceived Barriers to Education and Career: Ethnic and Gender Differences**. They investigated gender and ethnic differences in education and career by using a sample of 1139 Euro-American and Mexican-American high school seniors and juniors. They used ANOVA and MANOVA method to assess the gender gap. They found that female participants face more difficulties than male, Mexican-American participants suffer more obstacle than Euro-Americans. They found consistent differences in gender and ethnic groups.

Moheyuddin. G (2005) conducted a qualitative research named **Gender Inequality in Education: Impact on Income, Growth, and Development**. He used female education as an endogenous variable that can be explained by some factors in a significant extent like regional factors, religious preference and civil freedom. He concluded that low investment in female education is not an efficient choice for developing countries and it is bad for economic growth; increase in per capita income can decrease gender inequality.

Balatchandirane. G conducted (2007) a research paper named **Gender Discrimination in Education and Economic Development: A Study of Asia** through quantitative approach. He examined gender discrimination in Asian countries and made a correlation between economic growth and gender discrimination. He used Becker's Coefficient of Discrimination to measure the extent of discrimination against female. Literacy Rates, Enrolment Rates, Attendance Rates and Mean Years of Schooling were the variables of this study. He found that Becker's Coefficient Value can be vary from zero to infinity but author rarely found any value above 4, but the value of 4 indicates high discrimination in education.

Jayachandran. S (2015) made a quantitative analysis named **The Roots of Gender Inequality in Developing Countries**. She conducted a cross sectional study through the ratio of the college enrollment rates of male and female that was plotted against GDP per capita for World Bank's World Development Indicators (WDI) data set's listed countries. She used Male College Enrollment Rate, Female College Enrollment Rate, and GDP Per Capita as variables. She concluded that when GDP increase male biasness falls. She also found a negative relationship between primary and secondary school enrollment and GDP that indicates major gender gap.

Odomore. A (2015) conducted a paper named Challenges to **Female Education in the Developing World and International Efforts to Address Those Challenges**. He summarized many articles and represented eight developing countries' cross sectional analysis. He concluded that many factors affect female education in developing countries like poverty, religious custom, child marriage, menstruation, war conflicts, ancient traditions, and aversion regarding western education.

Gautam. R, Reining. A and Holasek. K (2017) conducted a quantitative research named **Analyzing the Gender Disparity in Education between Developed and Developing Countries**. This paper includes a cross sectional study with F Test. Authors used several variables like Life Expectancy, Percentage Of Urban Population, GNI Per Capita (PPP), Poverty Headcount Ratio @ $1.90/Day (PPP), Expected Years Of Education (Female), Infant Mortality Rate, Log (GNI Per Capita), Log (Expected Years Of Education). They concluded that GNI Per Capita and literacy rate have positive correlation with female education and have the most powerful impact on the level of female education. On the other hand, poverty rate has a strong negative correlation with expected female education.

Kapur. R (2018) conducted a qualitative research named **Factors Affecting Girl Child Education**. She came to a conclusion that geographical, health, socio cultural, economic, educational, distance, religious and political factors affect female participation in education.

Methodology:

This paper analyses the extent of impacts of different factors on female education in both developed and developing countries by using a cross sectional analysis. This is a quantitative research that is conducted through some secondary data of 2010 from World Bank's World Development Indicators (WDI) data set. Statistical analysis of variables was conducted by STATA and the results of the STATA were interpreted respectively.

The analytical sector of this paper is divided into two sections. At first, the values for 10 developing countries were analyzed to understand the extent of impacts of different factors on female education. After that values for 10 developed countries were examined for the same purpose.

Model: Same model has been used in the both case of developing and developed countries.

edui= B0+ B1pcgdpi+ B2gei+ B3pvri+ B4lfpri+ui

Here, edu is dependent variable and rests of the variables are independent variables; i represents number of observation.

Variable Description:

Dependent Variable:

edu= Educational attainment, at least completed lower secondary, population 25+, female (%) (Cumulative)

It refers to the cumulative percentage of females among the population who are 25+ year old and who have completed at least lower secondary level of education.

Independent Variable:

pcgdp= GDP per capita growth (annual %)

It represents a country's economic growth that is done by its citizens. The value is measured by dividing a country's total GDP by its total populations.

ge= Government expenditure on education, total (% of government expenditure)

It represents the value that government spends for educational development. It is the value that government spends on education as a percentage of government's total spending.

pvr= Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population)

It is the percentage of population that spends less than $1.90 per day international prices of 2011.

lfpr= Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate)

It is the percentage of population ages 15+ that is active in the economy; the people who provide the labor in production.

ui= Error term

B0= Intercept or Constant

B1, B2, B3, B4= Coefficients of the independent variables.

Time Period: 2010

Data Source: World Bank Data (World Development Indicators Data Set)

Data Analysis and Interpretation of STATA Output:

Developing Countries:

Linear Regression Model Analysis:

Number of Observation: 6 (The number of observation should be 10 here but due to the missing value number of observation has been decreased.)

F (4, 1) = 12.54

Probability> F = 0.2083

R- Squared (R2) = 0.9805

Adjusted R- Squared= 0.9023

Root MSE= 7.1803

Source	SS	Df	MS
Model	2586.83559	4	646.708898
Residual	51.5571459	1	51.5571459
Total	2638.39274	5	527.678548

Variables	Coefficient	Standard Error
Pcgdp	12.73176	2.864097
Ge	-23.05212	4.013419
Pvr	11.90223	2.041088
Lfpr	2.724701	0.4101842
_cons	142.3591	26.86513

edu= 142.3591+ 12.73176 pcgdp – 23.05212 ge + 11.90223 pvr + 2.724701 lfpr

Here, the R2 value is 0.9805 that means 98% variation in the dependent variable can be explained by the variation in explanatory variables. Adjusted R2 is 0.9023 which is less than R2 as it is adjusted for the degrees of freedom. As the P value is 0.2083 which is less than 0.5 that means the regression model is statistically significant. There is a positive relation between pcgdp and coefficient, pvr and coefficient, and lfpr and coefficient. On contrast, there is negative relation between ge and coefficient.

Pair Wise Correlation (Significant at 0.05):

	Edu	**Pcgdp**	**Ge**	**Pvr**	**Lfpr**
edu	1.0000				
pcgdp	-0.1745	1.0000			
ge	-0.1730	0.6095	1.0000		
pvr	0.0397	-0.2095	0.2990	1.0000	
lfpr	0.4146	0.3954	0.4625	-0.2623	1.0000

This is the correlation matrix of the model where the values represent the coefficient of Pearson Correlation. The coefficient values which are close to 1 indicate robust correlation and also the negative values indicate adverse relation.

This model indicates that pcgdp and edu has a negative relationship that means when GDP per capita increases, educational attainment of female decreases as their coefficient is -0.1745. Same thing happens in the case of ge and edu as their coefficient is -0.1730. The variables pvr and lfpr have the positive relation with edu as their coefficients are 0.0397 and 0.4146 respectively.

Regression Diagnostic Test:

1. Heteroscedasticity Test:

It is situation where the variances of disturbance term (ui) are not constant. To detect the heteroscedasticity, Breusch- Pagan- Godfrey (BPG) Test has been conducted. To conduct the test, the hypothesis is the variances of error term are homoscedastic.

chi2(1) = 0.06

Prob > chi2 = 0.8065

Ho: Homoscedasticity

Ha: Heteroscedasticity

BPG Test depends on the value of chi2. If $p < 0.05$ then Ho will be rejected.

Here, p= 0.8065 which is higher than 0.05 so we cannot reject the Ho. That means the variances of the error term of this model are homoscedastic.

2. Multicollinearity Test:

Multicollinearity refers to a situation where there is a perfect or exact linear relationship between some or all explanatory variables of a regression model that means the independent variables are correlated. But this is not good for the model as explanatory variables have to independent. So it may create questions about reliability and significance of the model. Here, Variable Inflation Factor (VIF) is occupied to detect the presence of multicollinearity.

Variable	VIF	1/ VIF
Ge	17.27	0.057891
Pcgdp	14.76	0.067741
Pvr	14.44	0.069256
Lfpr	3.32	0.301041
Mean VIF	12.45	

The rule of thumb is if VIF> 10 or 1/ VIF< 0.10, that means the variable is highly collinear. Here, only lfpr is not collinear but rests of the variables have multicollinearity.

Developed Countries:

Linear Regression Model Analysis:

Number of Observation: 10

F (4, 5) = 3.16

Probability> F = 0.1193

R- Squared (R2) = 0.7166

Adjusted R- Squared= 0.4899

Root MSE= 7.1744

Source	SS	Df	MS
Model	650.777514	4	162.694379
Residual	257.358891	5	51.4717783
Total	908.136406	9	100.904045

Variables	Coefficient	Standard Error
Pcgdp	-1.096982	1.718369
Ge	-1.302776	2.571652
Pvr	-2.462182	6.486217
Lfpr	1.373877	0.7466566
_cons	34.22085	23.18753

edu= 34.22085 – 1.096982 pcgdp – 1.302776 ge – 2.462182 pvr + 1.373877 lfpr

Here, the R2 value is 0.7166 that means almost 72% of variation in the dependent variable can be explained by the variation in explanatory variables. Adjusted R2 is 0.4899 which is less than R2 as it is adjusted for the degrees of freedom. As the P value is 0.1193 which is less than 0.5 that means the regression model is statistically significant. There is a negative relation between pcgdp and coefficient, ge and coefficient, and pvr and coefficient. On contrast, there is positive relation between lfpr and coefficient.

Pair Wise Correlation (Significant at 0.05):

	Edu	Pcgdp	ge	Pvr	Lfpr
edu	1.0000				
pcgdp	-0.1260	1.0000			
Ge	0.6707	-0.3207	1.0000		
pvr	-0.5211	-0.0222	-0.4106	1.0000	
lfpr	0.8261	-0.0338	0.8462	-0.5334	1.0000

This is the correlation matrix of the model where the values represent the coefficient of Pearson Correlation. The coefficient values which are close to 1 indicate robust correlation and also the negative values indicate adverse relation.

This model indicates that pcgdp and edu has a negative relationship that means when GDP per capita increases, educational attainment of female decreases as their coefficient is -0.1260. Same thing happens in the case of pvr and edu as their coefficient is -0.5211. The variables ge and lfpr have the positive relation with edu as their coefficients are 0.6707 and 0.8261 respectively. That means when government expenditure on education and labor force participation rate increase, educational attainment of female also increases.

Regression Diagnostic Test:

1. Heteroscedasticity Test:

It is situation where the variances of disturbance term (ui) are not constant. To detect the heteroscedasticity, Breusch- Pagan- Godfrey (BPG) Test has been conducted. To conduct the test, the hypothesis is the variances of error term are homoscedastic.

chi2(1) = 0.20

Prob > chi2 = 0.6572

Ho: Homoscedasticity

Ha: Heteroscedasticity

BPG Test depends on the value of chi2. If $p < 0.05$ then Ho will be rejected.

Here, p= 0.6572 which is higher than 0.05 so we cannot reject the Ho. That means the variances of the error term of this model are homoscedastic.

2. Multicollinearity Test:

Multicollinearity refers to a situation where there is a perfect or exact linear relationship between some or all explanatory variables of a regression model that means the independent variables are correlated. But this is not good for the model as explanatory variables have to independent. So it may create questions about reliability and significance of the model. Here, Variable Inflation Factor (VIF) is occupied to detect the presence of multicollinearity.

Variable	VIF	1/ VIF
Ge	5.13	0.194814
Pcgdp	5.07	0.197322
Pvr	1.43	0.698429
Lfpr	1.41	0.709658
Mean VIF	3.26	

The rule of thumb is if VIF> 10 or 1/ VIF< 0.10, that means the variable is highly collinear. Here, VIF of all variables are less than 10 and 1/ VIF is greater than 0.10. That means, there is no presence of multicollinearity in the explanatory variables of this model.

Findings:

Developing Countries:

The normal situation is there must be a positive relation between GDP per capita growth and female educational attainments. But in this model, a negative relation between these two variables has been arrived. Similar thing happens in the case of government spending on education and female educational attainments. GDP per capita growth rates in developing countries are comparatively higher as GDP increases from smaller value to higher value. But in some developing countries, there are still some social and cultural barriers to female education that may interrupt the attainment of female education. In most of the developing countries, government mainly focuses on primary level of education and spends the lion share on primary education. As this paper has been conducted through lower secondary level of female education, this may trigger a negative relationship between government spending and lower secondary educational attainments of female. Poverty headcount ratio and labor force participation rate have positive relationship with female education of lower secondary level. But poverty headcount ratio should have the negative relation with female education. This may happen because in some developing countries poverty ratio is high but government provides necessary arrangements for female education. Labor force participation rate may have positive or negative relation with female education based on different aspects. For instance, labor force participation can enhance female education as female can earn by their own and spend their earnings on their education. But they may have a negative relation in other context; if female work then they wouldn't have adequate time for their education.

In this study, for developing countries no independent variable has significant correlation with female education. By comparing the correlation between dependent and independent variable, it is clear that in developing countries, impact of per capita GDP growth rate and government spending on education have almost similar negative impact on lower secondary female educational attainments. Besides this, poverty headcount ratio and labor force participation rate of female have also almost similar positive impact on lower secondary female educational attainments. But the impact of labor force participation rate of female is higher.

Developed Countries:

Here the scenario of GDP per capita growth rate and female education is same as developing countries. These two variables have negative relationship which is not familiar. In developed countries, GDP per capita growth rate is lower that may force to get a negative relationship with female education. Government expenditure plays an important role on female education in developed countries as these two variables have positive relationship which is an acceptable situation. In developed countries, poverty headcount ratio is very low that trigger a negative relationship between poverty and female education and this is absolutely normal; female education increases as poverty decreases. In developed countries, labor force participation rate of female has a positive relation with female education and this may happen as women can afford their own educational costs.

In developed countries, the impacts of government spending on education and labor force participation rate of female are significant. But labor force participation rate of female affects the female education most. While considering negative relationship, impact of GDP per capita growth rate is higher than the impact of poverty headcount ration on female education at lower secondary level.

Conclusion:

Based on the regression model, it is clear that labor force participation rate of female has the significant impact on female educational attainment in both developed and developing countries and this is the strongest variable among all independent variables. This triggers an opinion that women can bear their own educational costs through earning by their own. The weakest variable for developing countries is per capita GDP growth rate and for developed countries is poverty headcount ratio.

This study shows that per capita GDP growth rate has negative relation with female education in both developed and developing countries which is not natural. Based on the result of this study, this situation indicates deleterious situation of not having fairness in the welfare distribution. So every government should focus on welfare distribution and development of human capital. In developing countries, government should more focus on education sector especially on above primary level of education. If governments of developing countries provide free education after primary level then situation can be changed with a good vibe. Government should create more awareness regarding the extensive importance of female education through social media, television, and campaign. Thus, the rate of female education will be higher and it can bring prosperity to any nation. Only men can't bear the burden of the economy and nation, they need the help and support of women to faster the economic growth; as females are almost the half of the population of the world so the role women on country's prosperity is significant.

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Appendix:

List of Countries

Developing Countries	Developed Countries
Bangladesh	Australia
Argentina	Belgium
China	Germany
Colombia	Italy
Pakistan	Netherland
Russia	Norway
Romania	Switzerland
South Africa	Sweden
Thailand	United Kingdom
Turkey	United States of America

Summary of Data:

Variable	Obs	Mean	Std. Dev.	Min	Max
c1	0				
edu	9	54.95057	23.68921	20.67874	92.26023
pcgdp	10	4.424713	3.987056	-2.23262	10.1031
ge	6	14.45462	3.325372	9.12913	18.04437
pvr	10	6.99	7.020201	0.1	19.6
lfpr	10	45.7558	15.11199	21.736	63.849

Variable	Obs	Mean	Std. Dev.	Min	Max
C2	0				
edu	10	89.94332	10.0451	69.11598	99.74095
pcgdp	10	1.985381	1.665275	-0.55484	5.20353
ge	10	12.73056	2.093452	8.72395	15.39088
pvr	10	0.36	0.4376706	0	1.2
lfpr	10	54.8607	7.256579	37.784	61.781