Budgetary Allocations, Literacy Rate and Number of Primary Schools in District Peshawar, Pakistan: Linkages and Empirical Evidence

Khadija Shams
Shaheed Benazir Bhutto Women University, Peshawar

Drawing on time-series data from Khyber Pukhtun Khuwa (K.P.K) province (the Northern Pakistan), an attempt has been made to evaluate the role of investment on primary education sector in improving literacy rate of Peshawar district. Using statistical analysis, a relationship between literacy rate and its potential determinants has been tested. The findings revealed that the major determinants are the budgetary allocation to primary education sector and the number of primary schools that matter positively and significantly. As studies employing good data from developing countries are rare, this paper can potentially make a good contribution to the existing literature, with special reference to Pakistan.

***Keywords*:** literacy rate, budgetary allocation, primary education sector, Northern Pakistan

Budgetary allocation for primary education sector has substantial association with literacy rate. This research analyzes the relationship of budgetary allocations over the period 1991-2005 with the literacy rate and expansion in the primary education sector of district Peshawar.

Peshawar is an ancient district of K.P.K (Khyber Pukhtun Khuwa) province in Pakistan. The total area of the district is about 1,257 square km with a total population of 3.575 million, approximately (Government of Pakistan 2008, Census data revisited, 2014).

In terms of educational facilities, Peshawar has a good network of educational institutions. There are 1206 primary schools (boys & girls) in that district. About 1,83,974 students (boys & girls) are receiving education in these schools. Majority of the students are joining Secondary schools after completion of primary education. There are 73 High schools, 74 Middle and 8 Higher Secondary schools, on boys' side, while on Girls side there are 6 Higher Secondary schools 22 High schools and 32 Middle schools in Peshawar District. The number of these schools is increasing every year to meet the growing demand but these are still insufficient due to the rapid increase in population. There are 14 colleges (boys & girls) as well as 10 professional colleges in the District (Government of Pakistan, 2008).

According to Education Policy and Data Center (2015), despite persistent emphasis on universalization of education and devising measures for its accomplishment there were only 65.57% boys of the age group 5-9 and 34.43% girls of the same age group in Khyber Pukhtun Khuwa for the year 2009-10 in primary schools i.e. 56.57% of the total number of boys and girls of the said age group. Total public sector budgetary allocations for education sector in Pakistan for the year 2000-01,2001-02, 2002-03 and 2003-04 were PKR 75184.207 million, PKR 77368.663 million, PKR 85029.465 million and PKR 110034.294 million respectively, and these allocations were 2.20%, 2.0%,2.11% and 2.5% of GDP respectively. Investment in education is 2.5% of GDP in Pakistan. Recommendation is to enhance allocation up to 4% of the GDP (Education sector Reform, 2001-2006). Budgetary allocations for education in K.P.K were PKR 6645 million, PKR 6906 million, PKR 8269 million PKR 8890 million, PKR 14042.070 million and PKR 16975.235 million for the year 1998-99, 1999-2000, 2000-2001, 2001-2002, 2003-2004 and 2004-2005 respectively (Government of Pakistan, 2003-04). In spite of recent increase in fund allocation in K.P.K, a small share of educational expenditures goes to primary education and this is one of the reasons of heavy drop-out at primary level, 15% of the students abscond even during their first year of schooling, 50% of the students hardly completed their four years and less than 10% of the students joined secondary schools in the year 2004 in K.P.K (ESR, 2001-2006). The literacy rate (10 years and above) increased with the

Correspondence concerning this article should be addressed to Dr. Khadija Shams, Assistant Professor Department of Economics, Shaheed Benazir Bhutto Women University, Peshawar, Email: kshams@sbbwu.edu.pk

increase in the budgetary allocations for education, for the successive years from 1991 to 2004 for K.P.K. It was 35.4%, 39.3% and 43.0% in 2000-01 2001-02 and 2003-04 respectively (Government of Pakistan, 2004-05).

The budgetary allocation for primary education sector in Peshawar district has increased every year which resulted in increase in enrollment level in primary schools, e.g. the enrollment in class 5th has increased from 259857 to 279585 from year 2001 to 2004 due to higher allocation of budget to the primary education sector in Peshawar (personal communication with directorate of school and literacy, Peshawar, 2006).

This research will help the planners and policy makers to achieve sustainable social and economic development (Millennium Development Goals) in the country through investment in education sector and efficient planning at the grass-roots level.

Many papers have explored the idea that effective public policies and investment in education would help in expansion of education. Positive effects are obtained in a certain number of papers, but this is not linked to the social and economic development. Few papers have investigated this possibility, for instance, according to Psacharopoulos and Woodhall (1985), investment in education helps to achieve economic efficiency and improves income distribution.

Ajetomobi and Ayanwale (2005) in a study on Nigeria found that the government's budget provided to the educator sector is very limited, which might have hindered the enrollment, employment and economic growth rate in Nigeria. Hossler, et al., (1997) examined no statistically significant relationships between teaching standards at state funded programs and govt. institutions. Thompson and Zumeta (2001) suggested that govt. should give price incentives to the students to compete private colleges and universities. Bhatti et al., (1997) also pointed out that higher income group people prefer private schools for their children education and this is due to the fact that more facilities are provided for the students in these schools. Even poor families, who cannot afford the expenses of private schools, prefer to send their children to private schools in order to receive better education. These parents make a lot of sacrifices for that purpose.

Clotfelter (1996) and Ehrenberg (2001) explained the diversities and the increased tuition expenditure at the state colleges and universities, because of the progress over the study time period. Similarly, Long (2004) and St. John (1994) analyzed that decrease in govt. support and financial aid have led to raise tuition prices at the govt. institutions. Alexander (1998) emphasized the need for giving more educational opportunities to the students in general and particularly to the students belonging from the lower-income families. Zumeta (1992) analyzed comparative benefits to public and private institutions. Given the limited govt. resources, the author suggested to fully exploit the private sectors. Klein et al., (1995) and Masten (1995) explained how the different financial aid programs and policies interact each other and dilute the programs aims and objectives.

McPherson and Shapiro (1991) favored state student aid programs to support education at schools, colleges and universities. Furthermore, they examined that increased government aid helped schools to generate more revenue. Dynarski (2000) examined a positive effect of financial aid programs on attendance rate of college students, particularly belonging from the higher income groups. Similarly, Dynarski (2004) examined how merit aid programs in seven states have affected an array of schooling decisions. He found that the programs typically increase the attendance probability of college-age youth by 5 to 7 percentage points. Furthermore, the merit programs also shift students toward four-year schools and away from two-year schools. Dearden (2004) studied that whether a means tested grants paid to secondary students are an effective way of reducing the proportion of school drop-outs. He observed that the policy goes some way to reducing the gap in drop-out rates between boys and girls. It is also stated that the policy has the largest impact on children from the poorest socio-economic background.

Rationale for the Study

The studies conducted reveals that investment in education has positive impact on access and expansion of education. In the literature cited above, the ultimate consequences of policy implementations on

education sector were examined. Role of aid on students' attendance, dropout and schooling decision has also been discussed.

Different observations supporting the main thrust of this study has been noted from the foregoing literature review. First, primary level, the beginning of educational enterprise with children, is the basis of the pyramid of education. Effective budgetary allocations are essential for making the educational programs a success. Second, high literacy rate and enrollment ratio, increase in number of schools and teachers and improvement in infrastructure can be achieved through appropriate public investment in education sector.

Method

Sample

District Peshawar was the universe of the study, in which all government primary schools (boys and girls) were taken into consideration.

Data and Methodology

According to the nature of the study, secondary data has been used. A time series data (1991-2005) was obtained through direct personal investigation (interview schedule) from Directorate of Primary Education, K.P.K, Directorate of School and Literacy Peshawar and Executive District Office (EDO) Peshawar city. Moreover, great care has been taken to clean and to double-check the data with the official documents of the concerned authorities in order to avoid inaccurate records. The data has been described and analyzed statistically using correlation analysis technique to test for a relationship (if any) between literacy rate and its potential determinants. The statistical analysis has been done using STATA (integrated statistical software package).

Table 1 shows year-wise budgetary allocations for primary education sector, overall enrollment size and dropout rate in the primary schools from 1991 to 2005.

Table 1

Total Annual Budgetary Allocations for Primary Education Sector versus Overall Enrollment Size and Dropout Rate

Fiscal Years	Total Budgetary Allocation for Primary Education Sector, in Pakistani Rupees (PKR)	Overall Enrollment Size	Overall Dropout Rate (%)
1991-92	110120411	105721	4.53
1992-93	117221423	125164	5.14
1993-94	126452300	134886	4.00
1994-95	133833111	153241	4.56
1995-96	143100100	159308	7.90
1996-97	154333111	164727	9.00
1997-98	160224000	167165	11.85
1998-99	171447000	170392	13.00
1999-00	233064010	173194	12.50
2000-01	268143200	174874	12.65
2001-02	288268000	177221	12.10
2002-03	341311000	179514	11.67
2003-04	394059101	181017	10.38
2004-05	463622000	190342	9.00

Source: Directorate of Primary Education, K.P.K, Pakistan, 2006.

The above table indicates year-wise improvement in the budgetary allocations to primary education sector in Peshawar district. For example in 1991-92 the total budget allocated to primary education sector was PKR 110120411 that was increased to PKR 463622000 in 2004-05, which indicates that the total budget was increased by PKR 353501589 from 1991-2005. According to the above table, the overall enrollment size has increased by 84621 with the total increase in budgetary allocation from 1991 to 2005. On the other hand, the overall dropout rate has also increased from 4.53 % in 1991-92 to 9% in 2004-05.

Table 2 shows the annual growth rate of budget with respect to overall literacy rate, number of primary schools and annual growth rate of population over the period (1991 to 2005) in Peshawar district.

Table 2

Growth Rate of Annual Budget versus Overall Literacy Rate, Number of Primary Schools and Annual Growth Rate of Population

Fiscal Years	Annual Growth Rate of Total Budget (%)	Overall Literacy Rate (%)	Total Number of Primary Schools	Annual Growth Rate of Population (%)
1991-92	5	34.00	609	2.25
1992-93	6	34.65	656	2.30
1993-94	7	35.45	698	2.45
1994-95	5	36.53	795	2.30
1995-96	6	38.13	826	2.40
1996-97	7	38.26	867	2.45
1997-98	4	39.81	888	2.20
1998-99	7	40.91	909	2.40
1999-00	35	41.25	940	2.65
2000-01	15	41.20	969	2.59
2001-02	8	41.86	994	2.45
2002-03	18	42.73	1008	2.60
2003-04	15	43.83	1021	2.59
2004-05	17	45.13	1036	2.60

Sources: 1. Directorate of School and Literacy, K.P.K, Peshawar, 2006; 2. Executive District Office (EDO), K.P.K, Peshawar, 2006.

According to Table 2, the annual growth rate of population in 1992-93 was 2.3% which was followed by an increase in the total budget by 6%. Similarly in 1993-94 when the growth rate of population increased to 2.45%, the total budget also increased to 7%. The facts and figures show that both the variables move in the same direction, which indicates a positive correlation between the two variables i.e. when population increases the total budget allocated to education sector also increases, which helps in increasing the literacy rate and the number of primary schools. For example in 1992-93 the literacy rate was 34.65% that increased to 35.45 % in the next year due to increase in total population and total budget by 2.45% and 7%, respectively; similarly, the number of schools increased by 42. On the whole, we observe an upward trend in all the variables shown in Table 2.

Table 3 shows total budget break up with respect to sex ratio in primary education sector over the time period (1991 to 2005) for Peshawar district.

Table 3

Total Budget Break-Up versus Sex Ratio

Fiscal Years	Share for Boys in Total Budget (%)	Share for Girls in Total Budget (%)	Sex Ratio (Boys: Girls)
1991-92	54	46	102:100
1992-93	55	45	104:100
1993-94	55	45	106:100
1994-95	56	44	108:100
1995-96	57	43	108.5:100
1996-97	58	42	109:100
1997-98	57	43	110:100

1998-99	59	41	111:100
1999-00	61	39	113:100
2000-01	62	38	117:100
2001-02	61	39	121:100
2002-03	64	36	125:100
2003-04	64	36	127:100
2004-05	63	37	129:100

Source: Directorate of Primary Education, K.P.K, Pakistan, 2006.

According to Table 3, the percentage of share for boys in the total budget was greater than the percentage of share for girls during the given time period and the corresponding sex ratios indicate higher strength of boys as compared to girls in the primary education sector. The percentage of share for boys in the total budget has increased with each successive year from 1991 to 2005 and the percentage of share for girls in the total budget has decreased, that shows an upward trend in the percentage of share for boys in the total budget and a downward trend in the percentage of share for girls' primary education in the total budget. The higher budgetary allocation towards the boys' side led to increase in sex ratio in the primary education sector each year from 1991 to 2005.

Results

Descriptive Analysis

The Government of Pakistan initiated various policies and strategies for strengthening education sector. The major of them are Elementary Education, Adult Literacy, Early Childhood Education and Education Sector Reforms in Pakistan.

In 1991-92, the total budget allocated for primary education sector (boys and girls) for District Peshawar was PKR 110120411, and has increased to PKR 463622000 in 2004-05 indicating 321% growth in the allocation during the period under consideration. During the same period the overall literacy rate has gone up from 34% to 45.13%, the overall enrollment size by 84621 and the total number of primary schools in Peshawar district increased by 427. On the other hand, the overall dropout rate has increased from 4.53 % in 1991-92 to 9% 2004-05 (Directorate of Primary Education, K.P.K, Pakistan, 2006). In the light of the given results it has been proved that increase in budgetary allocations did not have a strong relationship with the overall dropout rate, because among budgetary allocation there are a lot of other factors which lead to high Drop-out rate in government primary schools i.e. low per capita income of the people, heavy load of school bag, long distances of schools from homes, inadequate knowledge of the child psychology on the part of teachers and parents and other cultural constraints etc.

On boys' side, during the period under consideration the total budgetary allocation for primary education sector stood at PKR 60009100, whereas it increased to PKR 290322000 in 2004-05 indicating 384% rise in the budgetary allocation. Presumably the given budgetary push has increased; the literacy rate from 45 % in 1991-92 to 60% in 2004-05, enrollment size by 47947 and the number of schools by 256 and the dropout rate has increased by 2.95 % from 1991-92 to 2004-05 (Directorate of Primary Education, K.P.K, Pakistan, 2006).

On girls' side, the total budget allocated for primary education sector (girls) was PKR 50111311 in 1991-1992, however it increased to PKR 173300000 in 2004-05 showing 246 % growth in the budgetary allocation that has probably resulted in an increase; in literacy rate from 23% in 1991-92 to 30% in 2004-05, enrollment size by 36674 and the number of primary schools by 171 and the dropout rate has increased by 6 % from 1991-92 to 2004-05 (Directorate of Primary Education, K.P.K, Pakistan, (2006).

The data reveals that there is high dropout in girls compared to boys, potentially because of religious and cultural reasons.

Statistical Analysis

It may be worthwhile to investigate interrelationships among literacy rate and its potential determinants i.e. the total budgetary allocation to primary education sector, enrollment size, population growth rate and total number of primary schools. Table 4 reports correlation coefficients between the given variables.

Table 4

Correlation Matrix

	Overall Literacy Rate	*Total Budgetary Allocation*	*Overall Enrolment Size*	*Population Growth Rate*	*Number of Primary Schools*
Overall Literacy Rate	*1*				
Total Budgetary Allocation	*0.9040****	*1*			
Overall Enrolment Size	*0.9393****	*0.7602****	*1*		
Population Growth Rate	*0.7170****	*0.7466****	*0.6629****	*1*	
Number of Primary Schools	*0.9749****	*0.8363****	*0.9789****	*0.7047****	*1*

*Note: *, ** and *** denote statistical significance at 10%, 5% and 1% levels, respectively.*

Indeed, all the variables we consider are strongly and positively correlated as shown in Table 4. For instance, it has been observed that high budgetary allocation, enrollment size, population growth rate and total number of primary schools go hand in hand with high literacy rate and vice versa. As all the variables are significantly interrelated; under such a condition, we can get a relative pure correlation between dependent and independent variable, with the effect of other control variable(s) removed.

In probability theory and statistics, partial correlation measures the degree of association between two random variables, with the effect of a set of controlling random variables removed. Similar to a multiple regression analysis, partial correlation seeks to measure a relationship between dependent and independent variable, whilst eliminating potential effects of other control variable(s). The partial correlation coefficients measure in this case the degree of statistical association between overall literacy rate, total budgetary allocations to primary education sector, overall enrollment size in primary schools, annual growth rate of population and total number of primary schools in Peshawar district over the period from 1991 to 2005; where the former one is considered as the dependent variable and the rest are the set of controlled variables. Results are shown in Tables 5.

Table 5

Partial Correlation Analysis

Partial Correlation of "Overall Literacy Rate" with		
Variable	*Corr.*	*Sig.*
Total Budgetary Allocation	*0.6919***	*0.018*
Overall Enrollment Size	*0.0905*	*0.791*
Population Growth Rate	*-0.1690*	*0.619*
Number of Primary Schools	*0.5367**	*0.089*

*Note: *, ** and *** denote statistical significance at 10%, 5% and 1% levels, respectively*

Table 5, columns two and three report the partial correlation coefficients and the corresponding significance levels, respectively. As expected, the statistical results confirm that higher the allocation of budget

to primary education sector, higher will be the literacy rate. We find a strong positive and statistically significant correlation of 0.69 between the budgetary allocations to primary education sector and overall literacy rate over the time period. Similarly, the total number of primary schools which theoretically should have positive relationship with the overall literacy rate, as higher the number of primary schools the higher would be capacity to absorb maximum number of students and therefore it might potentially lead to higher literacy rate. The result confirms the mentioned relationship. The coefficient of the concerned variable is positive and is found to be statistically significant (*0.54)*. The other variables such as population growth rate and overall enrollment size are also justified theoretically in terms of their relationships with the literacy rate, however, on pure statistical grounds; it is not obvious per se whether any relationship exists at all. In the former case the results show an inverse relationship (indicated by the negative sign of the coefficient) between the independent and dependent variable, which has strong theoretical grounds. As the population grows at a higher rate compared to the efficient utilization of the resources in the education sector, the ultimate consequences are reflected in low literacy rate. It can also be deducted that either the government should try to control the population growth rate or it should efficiently utilize the resources to meet the increasing educational demands of the raising population. In the later case, as the overall enrollment size increases, the literacy rate in turn is also increased; however the higher dropout rate may nullify the relationship. Summing up, the current study links directly the three variables; budgetary allocation, number of primary schools (used as proxy for expansion in primary education sector) and literacy rate, in the light of strong empirical evidence. Hence, we may conclude that higher budgetary allocation promotes expansion in primary education sector and literacy rate. However, such linkages could not be dealt adequately without employing insights from economics. For instance, we may argue that increase in population growth and enrollment size indirectly influence literacy rate by exerting an upward pressure on the key variables i.e. budgetary allocation and total number of primary schools.

Conclusion and Recommendations

Statistical results showed that the explanatory variables such as budgetary allocations and total number of primary schools have positive and significant relationship with overall literacy rate. In order to increase the literacy rate, the budgetary allocation for primary education sector should be increased. The investment in education is 2.5% of G.D.P in Pakistan, which resulted in low rate of literacy in Pakistan as compared to its neighboring countries where the ratio ranges from 4-5 percent of GDP. Therefore it is highly recommended to enhance allocation at least up to 4-5 percent of the G.D.P in order to achieve sustainable social and economic development (Millennium Development Goals). Investment in early learning initiatives can provide many long term economic benefits for society. Efforts are also required to effectively utilize the given funds as the growth rate during the period under discussion in terms of budgetary allocation was quiet high compared to the overall literacy rate and the population growth rate. Thus there is a need to reduce this widening gap. More importantly, to promote girls' education, the budget should be distributed at least equally among boys and girls in primary education sector. Moreover, in order to reduce the dropout rate and to increase size of enrollment, awareness about education in general and particularly about girls' education should be produced through media (e.g. radio, T.V and newspapers etc…) so as to avoid other factors if any, which may hinder the literacy growth in future.

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