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2009

Online at <https://mpra.ub.uni-muenchen.de/28323/>

MPRA Paper No. 28323, posted 26 Jan 2011 09:10 UTC

PRIOR ACHIEVEMENT IS THE INDICATOR OF USE OF SCHOOL RESOURCES AND THE PREDICTOR OF ACADEMIC ACHIEVEMENT IN PUNJAB (PAKISTAN)

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Abstract

This study investigates whether prior achievement or the prior ability is the important indicator of the use of school resource inputs and the predictor of academic achievement at secondary level in Pakistan. Prior achievement is the cumulative function of all the current and prior resource inputs i.e. family inputs, SES, peers' effect and SRIs. Prior achievement is an indicator of learning or an aptitude to learn and use the SRIs effectively. Population of the study comprised all secondary and higher secondary schools and secondary students in Punjab. Overall, a total of 288 schools, and then 20 students from each school were randomly selected as the sample of the study. The longitudinal data of academic achievement in the form of aggregate marks of the annual examinations of the Classes VI, VII, & VIII as prior achievement and that of the Class X as academic achievement of the same students through "Result Sheet". The data were summarized at school level and then analyzed collectively. Pearson correlation was used to find out the relationship (association) of prior achievement with the academic achievement. Furthermore, Stepwise Regression analysis with linear function was used to find out the differential impact (causal-relationship) of prior achievement on the academic achievement. The results of the study show that the prior achievement has a significant differential impact of prior achievement on academic achievement. It is derived that prior achievement plays a major role in producing academic achievement and that it is a very important predictor of academic achievement. The policy implication of this study is that is that students with the standard prior achievement must be ensured as the admission criteria at secondary stage. Likewise, this policy must be implied to all the levels of education.

Keywords: prior achievement; resource inputs; predictor, relationship (association); differential impact (causal-relationship); academic achievement

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PRIOR ACHIEVEMENT IS THE INDICATOR OF USE OF SCHOOL RESOURCES AND THE PREDICTOR OF ACADEMIC ACHIEVEMENT IN PUNJAB (PAKISTAN)

Prior achievement (PA) or the prior ability of students indicates what potential students bring with them. Student achievement, at any point, is a cumulative function of the current and the prior resource inputs i.e. family inputs, SES, peers' effect and SRIs. It is the net product of the entire prior and the current resource inputs. The better PA, usually, produces better student achievement at the next stage. Therefore, this is an important resource input to the next stage of education.

According to the Coleman Report (1966), the most important resource input is socio-economic status (SES) of students. The report concluded that SRIs have hardly any effect on student achievement. However, the SES and family background of students and peers' effect were more effective in producing student achievement. However, an educationist can deal and control only the school resource inputs (SRIs). Therefore, SRIs are more addressed in the research policies. Furthermore, the availability of SRIs in a school is not enough until, they are efficiently used. The inefficient use of SRIs can not produce a better student achievement. Likewise, resource achievement of the inefficient used added SRIs in a school is not clear as Hanushek (2006) clarified it in the words:

And, if the resource use is inefficient, the relationship between added resources and outcome is unclear. This simple observation motivates a direct investigation of the relationship between outcomes and inputs to schools. (p. 4)

The effective use of SRIs is very important in the education process; however, it depends upon the students' ability to use them. Likewise, students' ability to use the SRIs depends upon PA or the prior ability of students. Usually, a student with a higher PA or the prior ability is more active in learning process. Actually, he uses the SRIs more efficiently and gets benefits more effectively. Therefore, PA has an important role in the education process; however, its role has not been investigated through research in most of the countries of the world. For the effective use of SRIs, it is very important to investigate the role of PA.

Furthermore, the government is spending enough in the education sector and the quality of education has a declining trend in Pakistan; particularly science education that is reaching its lowest ebb (Government of Pakistan, 2002). Government of Pakistan (2009) also insisted on maximising the effects of resource inputs. In this way, there is a strong emphasis on the pursuit of educational resource achievement in the ongoing educational reforms in the country.

Therefore, it is the dire need to investigate the role of PA in the education process in producing the academic achievement. This study provides an overview of the current state of knowledge and investigates the relationship between the prior achievement and academic achievement of students at secondary stage.

Review of Literature

Literature was reviewed in the following paragraphs:

1. Prior Achievement

A factor that was not discussed in most of the previous research studies is prior achievement (PA) of students. PA shows prior ability and prior performance of students in the previous classes. At the elementary stage, family background and SES become a foundation for a student when a child enters the nursery class.

However, elementary education provides a foundation for secondary education. If academic achievement of students at elementary education is better, it will provide better foundation for secondary stage. Hence, academic achievement of elementary education is PA for secondary stage (Classes IX & X). Usually, aggregate scores of Class VIII are used as academic achievement of elementary education. However, there is an issue of the reliability of these scores at elementary level. Therefore, the mean of aggregate scores of three Annual Examinations of the Classes VI, VII & VIII are used as PA.

2. Academic Achievement

Different researchers measure academic achievement differently. Some of them develop standardized tests whereas many of them use aggregate scores of examination to measure academic achievement. However, many of them use the individual marks of subjects as academic achievement. In Pakistan and other developing countries, the scores obtained by students usually measure school performance and academic achievement. Although the use of examination scores to evaluate academic achievement is highly contested, yet it is the best available, reliable, and valid indicator that is universally acceptable in most of the developing countries (Lockheed & Hanushek, 1988). Similarly, Iida et al (2000) and Rana (2002) used the aggregate matriculation examination results and Intermediate results respectively, as academic achievement.

3. Review of Related Research

Prior achievement (PA) or the prior ability of students plays a very important role in the learning process. The various researchers investigated that PA or the prior ability has a significant impact on student achievement, particularly academic achievement. However, there is some variation in their findings.

Irwin, Yarbrough, Klein & Townsend (1978) investigated the relationship of family characteristics and prior ability, with school attendance and school achievement in the three rural Guatemala communities. The study concluded that school grades were predicted by pre-schooling mental test scores (prior ability) and the intellectual inspiration provided in home rather than the family SES level.

Uz & Eryilmaz (1999) also found that PA of students was a significant factor affecting the students' attitudes toward physics. The study cited Peterson & Carlson (1979) that concluded that PA resulted in positive attitudes. Uz & Eryilmaz (1999) also cited Gardner (1975) that

found that PA motivated students, tend to maintain the more favorable attitudes towards physics. Likewise, Gregoire, Ashton & Algina (2001) concluded that only the prior ability and the perceived ability were the significant predictors of course grade. Similarly, Albernaz, Ferreira & Franco (2002) also concluded that SES characteristics and prior ability showed far-more robust influence.

Furthermore, Garavalia & Gredler (2002) investigated the extent to which learning strategies, PA, and aptitude of college students forecasted student achievement for a course. The study found the significant relationship of the three-predictor variables learning strategies, PA and aptitude with course achievement. The total variance in the course achievement owing to these three variables is accounted for 45%. Prior grades, Factor One of the scale (General Organization and Planning strategies) and SAT score explained the achievement significantly.

Carroll & Garavalia (2004) also contributed to this discussion. The study evaluated the relationships among various factors including prior ability in a single professional pharmacy program. Prior ability was measured by the admission data (PCAT scores, Science/Math GPA). This data were acquired from the individual databases of institutions. It was found that four variables were the significant factors varying the performance of higher and lower achievers. On the PCAT examination, low achievers acquired significantly lower scores in the subject of Chemistry than those of the higher achievers. Furthermore, higher achievers proved to have better self-efficiency through their predictable grade. Likewise, lower achievers showed the worse attainment calibration and indicated the lower predictable grade.

Afterwards, Nascimento (2008) found positive effects of resource inputs' variation on student achievement. Likewise, according to Eryilmaz (1992) cited by Nascimento (2008), the cumulative GPA and prior achievements had strong influences on student achievement in physics.

Almost, all these studies concluded that PA or prior ability of students has a significant impact on their further achievements. Likewise, all the studies agreed that PA or prior ability is a predictor of student achievement (Gardner, 1975; Irwin, Yarbrough, Klein & Townsend, 1978; Carlson, 1979; Eryilmaz, 1992; Uz & Eryilmaz, 1999; Gregoire, Ashton & Algina, 2001; Albernaz, Ferreira & Franco, 2002; Garavalia & Gredler, 2002; Carroll & Garavalia, 2004; Nascimento, 2008). Therefore, it is concluded that PA or prior ability has a strong positive impact on academic achievement of students in the next grade.

Objectives of the Study

1. To identify the prior achievement of students at the secondary stage
2. To identify the academic achievement at secondary stage
3. To find out the differential impact of the prior achievement on academic achievement of students at the secondary stage.

Methodology

Population of the study comprised of all the 4801 secondary schools and all the secondary students in Punjab. A total of 288 secondary and higher secondary schools and 20 students from

each school were the sample of the study. However, a total of 4860 students participated in the study. An instrument “Result Sheet” was developed. The study used the longitudinal data of academic achievement of the same students. Mean of the annual marks of the classes VI, VII & VIII (session 2003-06) was used as the prior achievement (PA) of the students. However, marks of class X (The Annual SSC Examination 2008) were used as academic achievement of the secondary stage (session 2006-08). The data were collected personally through the result sheet. The collected data were summarized at the school level. Then the summarized data showing the between school variation were carried into the SPSS data file to analyze the data. The Pearson Correlation Coefficient was used to analyze and find out the value of relationship (association) between prior achievement and academic achievement. However, the Stepwise Regression Analysis was used to analyze and find out the differential impact of PA on academic achievement.

Results and Discussions

Prior achievement (PA) at elementary level (middle stage) and academic achievement of the secondary stage were identified through the result sheet. Mean of the prior results of the classes VI, VII & VIII was calculated from the result sheet separately for the science and arts students in their respective columns. Mean No. 1 was calculated for science students and mean No. 2 for arts students at school level. Likewise, mean of aggregate marks of The Annual Examination 2008 was calculated as academic achievement at school level separately for the science and arts students.

Table 1: Summary Statistics

Name of the Variable		Total Sample			Urban Areas			Rural Areas		
		Max	Min	Mean	Max	Min	Mean	Max	Min	Mean
Prior Achievement	Science Students	687	347	556	681	465	580	687	347	523
	Arts Students	660	320	488	660	357	503	630	320	469
Academic Achievement	Science Students	643	347	506	639	411	530	643	347	473
	Arts Students	611	291	422	611	300	436	567	291	406

Table 1 shows the statistics about PA and academic achievement.

Table 2: Relationship of Prior Achievement

		Correlation	
		Arts Students	Science Students
No. of Schools: (Arts Students)-----N = 258 (Science Students)—N = 252		Academic Achievement	
Prior Achievement	Correlation	.961	.954
	Sig.	.000**	.000**

Table 2 shows the magnitude of correlation between prior achievement (PA) and academic achievement as measured by the Pearson correlation coefficient. It is evident that the value of relationship for both types of students is positive and significant.

Table 3: The Differential Impact of Prior Achievement

Coefficients ^a		
No. of Schools: Arts Students--N = 258,	t	Sig.

Science Students--N = 252			
Prior Achievement	Arts Students	60.461	.000**
	Science Students	48.031	.000**

a. Dependent Variable: Academic Achievement

Table 3 presents the magnitude of the differential impact of PA on academic achievement as measured by the Stepwise Regression analysis coefficient. The t-value (impact) for both types of students “arts and science” is significant. However, the positive t-value shows its positive impact.

Table 4: Relationship of Prior School Environment

No. of Schools: (Arts Students)-----N = 258 (Science Students)—N = 252		Correlation	
		Academic Achievement	
Prior School Environment	Correlation	Arts Students	Science Students
		Sig.	.160
		.141	.003**

Table 4 shows the magnitude of correlation between PSEn and academic achievement as measured by the Pearson correlation coefficient. The value of relationship is insignificant for arts but significant for science students. However, the relationship is positive for both types of students.

The results of the study show that the prior achievement (PA) has positively significant relationship with academic achievement for both types of students. Likewise, PA has a significant differential impact of PA on academic achievement. It is derived that PA plays a major role in producing academic achievement and that it is a very important predictor of academic achievement. The study supports the findings of Irwin, Yarbrough, Klein & Townsend (1978), Uz & Eryilmaz (1999), Gregoire, Ashton & Algina (2001), Albernaz, Ferreira & Franco (2002), Iida et al. (2002), Garavalia & Gredler (2002), Carroll & Garavalia (2004) and Nascimento (2008) that PA is an important predictor of academic achievement.

Conclusions

The students with higher prior achievement (PA) have the higher aptitude to learn and use the SRIs effectively; therefore, they gain the higher academic achievement. Contrary to it, the students with lower PA have not the required aptitude to learn and use the SRIs effectively and gain only the lower academic achievement. It is concluded that if students with the standard PA are admitted, they may use SRIs effectively and gain a higher academic achievement.

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