

The Link of Pupil Teacher Ratio (PTR) to Student Learning Achievements in Pakistan

Policy Brief 04

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Pupil Teacher Ratio (PTR) is often seen as an important factor which affects student achievement levels in class. However, it is still ambiguous whether investing in improving PTR is a feasible option for governments to adhere to. This policy brief tries to shed some light on the effect of improving PTR in Pakistan's case, using data from the Annual Status of Education Report (ASER) Pakistan 2013. Improving PTR has positive effect on student achievement according to the ASER data however the effect size was found to be minute. Therefore, there needs to be a balanced investment between improving PTR and teachers' quality for improvement in quality of education.



Introduction

Teachers are one of the most crucial factors of a child's education. Children may learn through many sources but formal teaching is seen to be the central source of learning. It is believed that quality of interaction between the students and the teachers affect the quality of learning. It is understood, without doubt, that if the quality of teaching is good, the learning achievement of students will be positively affected. However quality of teaching itself is made up of various factors such as teacher qualification, teacher training, teacher personality, teaching style etc. Amongst these factors the size of the class that the teachers are teaching is also considered important, i.e. if the size of the class is small, the learning achievement of students in that class will be better than the students in another class, which has a larger class size. In the case of the smaller class, teachers will be able to give more individual attention to the students and thus accelerating the learning process.

A lot of research has been done on the effect of class size on student achievement across the world in the past. However, the empirical research remains conflicting on the effects. Most researches on elementary and secondary students suggest that there is significant positive effect of reducing class size (Smith & Glass). Same is the case for students early primary grades i.e. Kindergarten through grade 3 (Robinson and Wittebols & Tennessee). However, there also exists research which says that a smaller pupil teacher ratio has very little or insignificant effect on student achievement. Research studies conducted by Hanushek and Shapson et al. are amongst two major ones that indicate insignificant effect of reduction in class size on student achievement.

It needs to be noted that each research has its own context and cultural element. Thus, generalizing research from Canada may not be in context with the environment in Pakistan. Therefore, in this policy brief, the context of Pakistan is considered exclusively. The Annual Status of Education Report (ASER) Pakistan 2013 data is used to gauge the effect of class size on student achievement. The data from 138 rural districts of Pakistan was collected during this survey.

ASER Pakistan as a Data Source

The ASER household survey contains a section in which children's learning levels are assessed in two literacy areas—Urdu and English—and one numeracy area, that of Arithmetic. (Sindhi and Pashto are used as the language of instruction in the provinces of Sindh and Khyber Pakhtunkhwa respectively; hence, testing of learning levels in both areas was conducted in their respective language of instruction instead of Urdu). The ASER assessment is conducted in households, while information on one government school and one private school (if available) in each surveyed village is also collected.

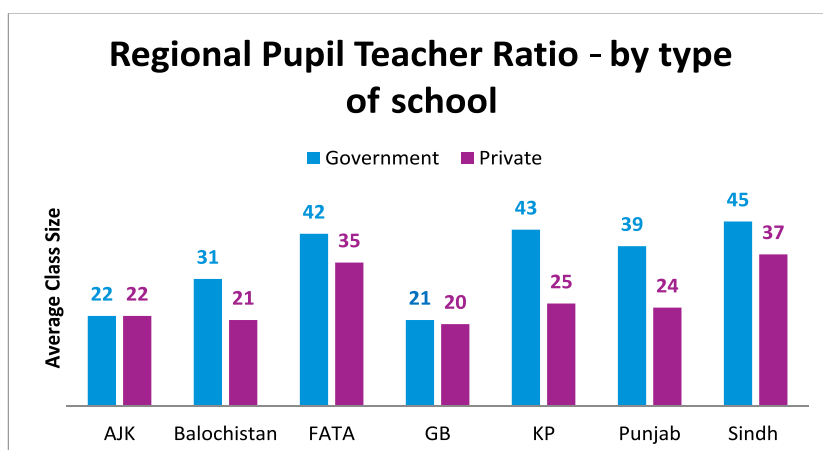
In order to gather the information required for this policy brief, we needed to connect the household and school information. The number of registered students and designated teachers in each school was included in the school data while students' individual assessment results were recorded in the household data. We were able to link the two samples by focusing on only those children from the household sample who were attending the surveyed schools. Thus, only the children who were reported as also enrolled in the ASER-surveyed schools were included in this sub-study. This process allowed us to recognize a total of 91,079 children of whom 15,391 children were attending private schools, and 75,688 children were attending government schools.

Average Class Size by Region

According to the ASER data, the average Pupil Teacher Ratio (PTR) in the country was found to be 35, with Gilgit-Baltistan having the lowest average class size of 20 and the province of Sindh having the highest average class size of 45. The table below ranks regions by average class size.

Class sizes were also observed to be different across different types of schools. Private schools in all regions had smaller class sizes as compared to government schools. Only in case of Azad Jammu & Kashmir (AJK) was the PTR the same for government and private schools.

Rank	Region	PTR
1	Gilgit Baltistan	20
2	Azad Jammu and Kashmir	22
3	Punjab	31
4	Balochistan	35
5	Khyber Pakhtunkhwa	40
6	FATA	41
7	Sindh	45



Learning Achievement

Learning achievement of students in this analysis is measured by the percentage of students able to read a Grade 2 level text in case of Urdu/Sindhi/Pashto and English. For the Arithmetic achievement the portion of students who were able to solve Grade 2 level problems is reported.

AJK, Punjab and Gilgit-Baltistan (GB) are amongst the top achieving regions in all three subjects, while Sindh consistently appeared at the bottom.

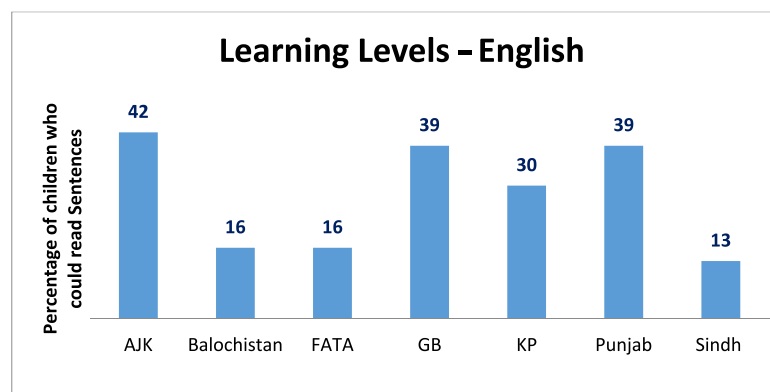
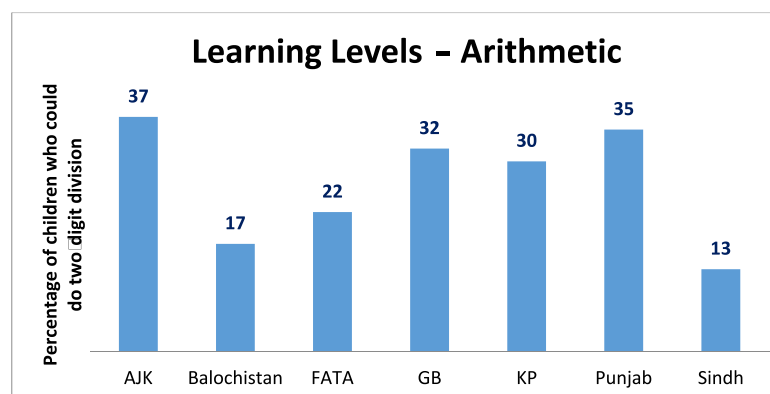
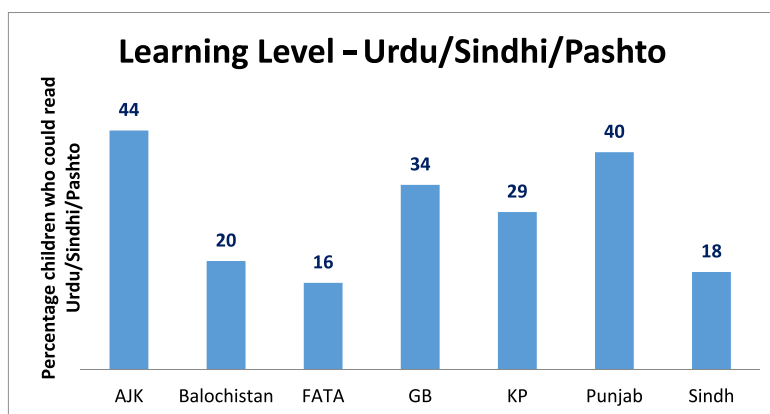
When we compare this state of learning achievement with the PTR ratios in each of these regions, the trend is seen to be the same in case of the top three regions and the lowest. This means that it may be possible that the smaller class sizes may be correlated with the higher learning achievements in case of AJK, GB and Punjab, and vice versa in case of Sindh. However still, there may be other factors driving the learning achievements in each of the regions, other than average class size in each.

Impact of PTR on Student Achievement

Raw data suggests that an increase in PTR has a negative effect on student achievement in Urdu/Sindhi/Pashto and this effect is found to be statistically significant. The effect size is 0.10 percent for Urdu/Sindhi/Pashto language assessment. This means that with a unit increase in class size, the student achievement in Urdu/Sindhi/Pashto language decreases by 0.1 percent.

However, there may be other factors affecting the achievement levels, other than the PTR. Therefore, a regression analysis is conducted for gauging the effect of PTR on student achievement after controlling for other variables such as age, grade, gender, whether the either of the parents have attended school, household wealth and school quality (regarding the physical facilities in the schools). The effect size of PTR after controlling for all other variables mentioned above further decreases the correlation between learning achievement and PTR. Even though the effect is still statistically significant, the magnitude of the effect is reduced to 0.02 percent in Urdu/Sindhi/Pashto; an even smaller effect.

Similar correlation results were found in case of Arithmetic and English assessment achievement and PTR.



Conclusion

Reducing class size may be a very popular education policy reform in general; however, the context of policy needs to be properly analyzed before execution. From the above analysis, it is evident that a smaller PTR may be beneficial for improving the learning achievements in schools; however the benefit may be very insignificant if the costs of implementing the policy are considered. Hiring more teachers for smaller class size will only reap a very small percentage change in the learning achievement of students, while substantially accelerating the costs. It might be wiser to consider improving the quality of the existing teachers by refining the teaching training programs, than getting a huge chunk of teachers on board for decreasing class size.

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