



LANA REPORT: PAKISTAN OVERVIEW

Pakistan Institute
of Education



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Authors:

Dr. Muhammad Shahid Soroya
Mr. Alberto Soriano Diaz
Dr. Muhammad Idrees Asad
Dr. Waqar Ahman Awan
Dr. Kanwal Ijaz
Ms. Tehreem Shoukat

Reviewers:

Dr. Farah Nadeem
Mr. Ghazanfar Ali Khan

Available from:

Pakistan Institute of Education (PIE),
Taleemi chowk, Jhelum Road, G8/1,
Islamabad Capital Territory,
Ministry of Federal Education and Professional Training
Ph: (051) 9260674, Fax: (051) 9261359
dg@pie.gov.pk

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Foreword

Dr. Muhammad Shahid Soroya,

Director General of the Pakistan Institute of Education (PIE)

It is with a strong sense of purpose and responsibility that I present this report on the Literacy and Numeracy Assessment (LaNA) information for Pakistan. This report provides an important snapshot of where our children



stand in foundational literacy and numeracy—skills that form the bedrock of all future learning. At the Pakistan Institute of Education (PIE), we are committed to generating reliable, evidence-based insights that can guide efforts to strengthen learning outcomes and ensure that every child acquires the competencies needed to succeed in school and beyond.

Pakistan faces persistent challenges in foundational learning, with many students struggling to achieve expected proficiency levels in reading, writing, and mathematics. The LaNA assessment offers critical data on students' performance across provinces, regions, and demographic groups, shedding light on both progress made and gaps that remain. By systematically analyzing this information, the report helps identify patterns of achievement and inequality, enabling stakeholders to better understand where targeted interventions are most urgently required. The findings underscore the need for focused investments in early grades, effective teaching practices, and supportive learning environments.

As Pakistan strives to improve the quality and equity of its education system, evidence from assessments such as LaNA is indispensable. Policymakers, education managers, and practitioners must use this data to inform planning, allocate resources wisely, and design interventions that directly address learning deficits. This report offers clear insights and practical implications that can support data-driven decision-making and meaningful reform. I am confident that it will serve as a valuable reference for all those working to ensure that every child in Pakistan develops strong foundational literacy and numeracy skills, laying the groundwork for lifelong learning and national development.

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Executive Summary

The 2023 Literacy and Numeracy Assessment (LaNA) provides an overview of the foundational learning outcomes of Grade 5 students in Pakistan. The assessment, conducted with the support of the International Association for the Evaluation of Educational Achievement (IEA) and the Pakistan Institute of Education, evaluated the reading and mathematics performance of **8,744 students across 360 schools nationwide**. The results provide insights into how learning outcomes vary across provinces, gender, school environments, and student background characteristics.

- **Pakistan's performance in the international comparison is moderate.** In the 2023 LaNA exercise, Pakistani students scored higher on average than students in Nigeria and Senegal but lower than students in Burkina Faso, Egypt, and the Palestinian National Authority in both reading and mathematics.
- **There are substantial disparities in learning outcomes across provinces.** Students in **Islamabad Capital Territory and Punjab consistently achieve the highest scores**, while **Balochistan and Khyber Pakhtunkhwa report the lowest performance**. These differences are particularly pronounced in mathematics, where the gaps between higher- and lower-performing regions are statistically significant.
- **Girls slightly outperform boys in both reading and mathematics.** Across most provinces, girls have higher average scores than boys. However, the differences are generally not statistically significant due to overlapping confidence intervals. At the same time, **girls' participation in schooling varies significantly by province**, with the lowest representation in Balochistan.
- **Students in urban areas tend to perform better than those in rural or remote areas.** Schools located in densely populated urban areas show higher average reading and mathematics scores compared with schools located in medium-sized towns and remote rural areas, reflecting differences in access to educational resources and opportunities.
- **Students in private schools tend to outperform those in public schools, particularly in mathematics.** Across Pakistan, students attending private schools achieve higher average scores in both reading and mathematics compared to those in public schools. While the difference in reading is not statistically significant at the national level due to overlapping confidence intervals, the gap in mathematics is statistically significant, indicating a meaningful performance advantage for private school students. At the provincial level, these differences are especially pronounced in Islamabad and Khyber Pakhtunkhwa.
- **School infrastructure and learning resources vary significantly across regions.** Access to facilities such as running water, electricity, toilets, playgrounds, and computers

differs by province. Students attending schools with better facilities generally achieve higher average scores.

- **Classroom resources are widely available but unevenly distributed.** Most students report access to chairs or benches, desks or tables, and textbooks, although availability is lower in some provinces. Students in classrooms with these resources tend to show slightly higher performance.
- **Distance to school is associated with learning outcomes.** Students who live closer to their schools tend to achieve higher scores than those who travel longer distances. In particular, students commuting more than one hour to school tend to have lower average scores.
- **Household resources are linked to student performance.** Students living in homes with access to electricity, running water, and other basic amenities generally achieve higher scores in reading and mathematics than those without these resources.
- **Student well-being is associated with academic outcomes.** Students who report arriving at school hungry or tired tend to have lower average scores. Conversely, students who feel safe at school and report a sense of belonging tend to achieve higher scores.
- **Student absenteeism is strongly related to performance.** Students who report rarely missing school achieve significantly higher scores in both reading and mathematics than those who report frequent absences.

Introduction

In many developing countries, the lack of technical and financial resources needed to conduct full-scale foundational learning assessments makes these kinds of exercises difficult to implement. Foundational learning assessments are technical and costly as children must be tested individually by a teacher, who evaluates different reading and mathematics domains. This is a different and more resource intensive approach than the traditional pen paper assessments that are conducted to evaluate children's knowledge. Given the complexity of these assessments, the Evaluation of Educational Achievements (IEA) has developed a simplified version of their formal assessments called Literacy and Numeracy Assessment (LaNA) that can be used in contexts that cannot support a full traditional assessment.

This report uses the data obtained from the LaNA exercise that was conducted in Pakistan in 2023. It also provides a series of insights based on the information collected through the questionnaires administered to head teachers and students. Through these, this report disaggregates the scores of children based on gender, location, school and house resources as well as other metrics related to the school experience of children in Pakistan. The main aim of these is to provide a better picture of how the different lived experiences of children in this country shape their academic outcomes and how these can be improved with targeted policy interventions.

Data and Methodology

The data used to produce this report comes from the Literacy and Numeracy Assessment (LaNA) that is produced by the International Association for the Evaluation of Educational Achievement (IEA). This assessment took place in 2023 across all provinces in Pakistan and was administered with the support provided by the Pakistan Institute of Education (PIE).

What is the Literacy and Numeracy Assessment?

The Literacy and Numeracy Assessment (LaNA) is an international assessment in literacy and numeracy that is easier to implement than large and technical assessments like Early Grade Reading Assessment (EGRA). This assessment follows the framework of the Trends in International Mathematics and Science Study (TIMSS) and the Progress in International Reading Literacy Study (PIRLS). However, it uses fewer number of booklets, which reduces the amount of time and resources needed to administer this assessment. In the 2023 exercise, the LaNA assessment was administered in Egypt, Burkina Faso, Pakistan, Palestine, Senegal and Nigeria.

International Benchmarking used and its interpretation

The LaNA exercise uses the literacy benchmarks from the PIRLS 2021 exercise (as shown in Table 1) and the mathematics benchmarks from the TIMSS 2019 exercise (as shown in Table 2). Below, a detailed description of these benchmarks has been provided to serve as a guide when interpreting the results of the analyses shown in this report.

Table 1: Summary of PIRLS 2021 International Benchmarks of Reading Achievement

Benchmark	Description
Advanced - 625	Literary When reading predominantly difficult literary texts, students can: • Interpret and integrate story events and character actions to describe reasons, motivations, feelings, and character development. • Evaluate the intended effect of the author’s language, style, and composition choices. Informational When reading predominantly difficult informational texts or online tasks, students can: • Make inferences about complex information across different web pages and parts of text to recognize the relevant information and list and use evidence in the text to support ideas. • Interpret and integrate multiple pieces of different information across text and web pages to present an overview of ideas in the text and provide comparisons and explanations. • Evaluate textual, visual, and interactive elements to explain their purpose, and identify the writer’s point of view and provide supporting evidence.
High - 550	Literary When reading medium and difficult literary texts, students can: • Locate and identify significant actions and details embedded across the text. • Make inferences about relationships between intentions, actions, events, and feelings. • Interpret and integrate story events to give reasons for character actions and feelings. • Recognize the meaning of some figurative language (e.g., metaphor, imagery). Informational When reading informational texts or online tasks of medium or high difficulty, students can: • Locate and identify relevant information in texts with a variety of features, such as diagrams and illustrations. • Make inferences to provide comparisons, descriptions, explanations, predictions, and choose a relevant website. • Interpret and integrate textual and visual information across texts and web pages to connect ideas, sequence events, identify characteristics, and provide explanations. • Evaluate the content to take and justify a position; describe how illustrations, diagrams, photographs, and maps convey and support content; and recognize the contribution of word choice in conveying the writer’s point of view.
Intermediate - 475	Literacy When reading literary texts of easy or medium difficulty, students can: • Locate, recognize, and reproduce explicitly stated actions, events, and feelings.

	• Make straightforward inferences about events and characters' actions. • Interpret reasons for characters' feelings or actions and identify supporting evidence. Informational When reading informational texts or online tasks of easy or medium difficulty, students can: • Locate, recognize, and reproduce explicitly stated information across texts. • Make straightforward inferences to provide comparisons, descriptions, and explanations. • Interpret and integrate to provide information about central ideas and reasons for actions, events, and outcomes.
Low - 400	Literary When reading predominantly easy literary texts, students can: • Locate, retrieve, and reproduce explicitly stated information, actions, or ideas. • Make simple, straightforward inferences about characters' actions. Informational When reading predominantly easy informational texts, students can: • Locate, retrieve, and reproduce explicitly stated information. • Make simple, straightforward inferences to provide a reason for an outcome.
Basic - 325	Literary When reading LaNA literary texts, students can: • Retrieve and recognize explicitly stated details and information from a limited section of the text. • Make simple straightforward inferences to recognize a character's action or feeling. Informational When reading LaNA informational texts, students can: • Retrieve and recognize explicitly stated details from a confined section of the text. • Make simple straightforward inferences about an action or a process.

Table 2: Summary of TIMSS 2019 International Benchmarks of Mathematics Achievement

International Benchmark	Description
Advanced - 625	Students can apply their understanding and knowledge in a variety of relatively complex situations and explain their reasoning. Students can solve a variety of multistep word problems involving whole numbers and show an understanding of fractions and decimals. They can apply knowledge of two- and three-dimensional shapes in a variety of situations. Students can interpret and represent data to solve multistep problems.
High - 550	Students apply conceptual understanding to solve problems. They can apply conceptual understanding of whole numbers to solve two-step word problems. They show understanding of the number line, multiples, factors, and rounding numbers, and operations with fractions and decimals. Students can solve simple measurement problems. They demonstrate understanding of geometric properties of shapes and angles. Students can interpret and use data in tables and a variety of graphs to solve problems.
Intermediate - 475	Students can apply basic mathematical knowledge in simple situations. They can compute with three- and four-digit whole numbers in a variety of situations. They have some understanding of decimals and fractions. Students can identify and draw shapes with simple properties. They can read, label, and interpret information in graphs and tables.
Low - 400	Students have some basic mathematical knowledge. They can add, subtract, multiply, and divide one- and two-digit whole numbers. They can solve simple word problems. They have some knowledge of simple fractions and common geometric shapes. Students can read and complete simple bar graphs and tables.
Basic - 325	Students show emerging understanding of calculations and can work with simple whole numbers. Students can add and subtract quantities when presented in mathematical contexts; they have some understanding of multiplication; and they can compare whole numbers. Students can identify shapes and have some knowledge about basic properties of common shapes. They can read straightforward data representations.

Students' and Principal's Questionnaires

Alongside the assessment, this study also collects data through two questionnaires that are administered to the students and the principals of the schools that participated in this exercise. These questionnaires are short, comprising of no more than ten questions and aim at obtaining information on key aspects of student's experiences in the education sector.

Sampling

For the Main Data Collection, each participating country was requested to sample at least 100 schools and approximately 4,500 students in the target grade to allow for sample loss due to anticipated nonparticipation. In total, 8,744 Grade 5 students from 360 schools were tested in this exercise across all provinces of Pakistan. The sample size for the Pakistan exercise is summarised in Table 3.

The target population figures were derived from the sampling frame used to select the LaNA 2023 samples. These figures do not account for the portion of the population excluded within sampled schools, nor were they adjusted for changes in the population between the date when the information in the sampling frame was collected and the date of the LaNA 2023 data collection (a one-year interval).

LaNA 2023 consulted with the sampling consultants from the IEA Sampling Unit to identify stratification variables to be used during sample selection. For Pakistan, the variables region and school type were used in this process (Annex 1).

Table 3: LaNA 2023 Linking Study Target Population and Sample Size for Pakistan

Province	Target Population		Sample	
	Schools	Students	Schools	Students
Pakistan	186,258	3,569,227	360	8,744

Confidence Intervals

The LaNA exercise presents its results using 95% confidence intervals (CI) to indicate the level of statistical uncertainty around estimated averages and percentages. A 95% confidence interval represents the range within which the true population value is likely to fall with 95% confidence, given the sample data and sampling design. Confidence intervals are used throughout the report to help readers assess the precision of the estimates and the degree of uncertainty associated with comparisons across groups, such as provinces, school location or student characteristics.

When comparing groups, non-overlapping confidence intervals generally indicate a likely difference between groups, and this criterion is somewhat more conservative than a standard 5% significance test. However, overlapping confidence intervals do not necessarily mean that there is no difference between groups. Differences may still exist even when intervals overlap, particularly when the overlap is small. Therefore, patterns and trends across groups should be interpreted cautiously, and consistent or monotonic patterns across categories can still provide useful insights. In addition, the width of confidence intervals is partly influenced by sample size. Estimates based on smaller subgroups tend to have wider confidence intervals, reflecting greater statistical uncertainty rather than necessarily greater variability in the underlying population.

Scale Scores and Estimation Method

Student achievement in mathematics and reading is reported on the TIMSS and PIRLS trend scales, which are widely used international assessment frameworks. These scales are constructed using Item Response Theory (IRT), a statistical method that estimates student ability based on responses to test items while accounting for differences in item difficulty. The LaNA assessment places student results on these scales using item parameters fixed from TIMSS 2019 and PIRLS 2021, allowing results to be interpreted within an established international measurement framework.

Achievement estimates are based on plausible values, which are multiple imputed estimates of student proficiency generated from the IRT model. Plausible values account for measurement uncertainty and are used to produce unbiased estimates of group-level performance. For this reason, results are reported with 95% confidence intervals rather than single point estimates, reflecting both sampling variability and measurement uncertainty. Because the LaNA assessment uses a smaller set of items than full international assessments, the resulting estimates have lower measurement precision, making the use of confidence intervals particularly important when interpreting differences across groups.

Mathematics and Reading Achievements

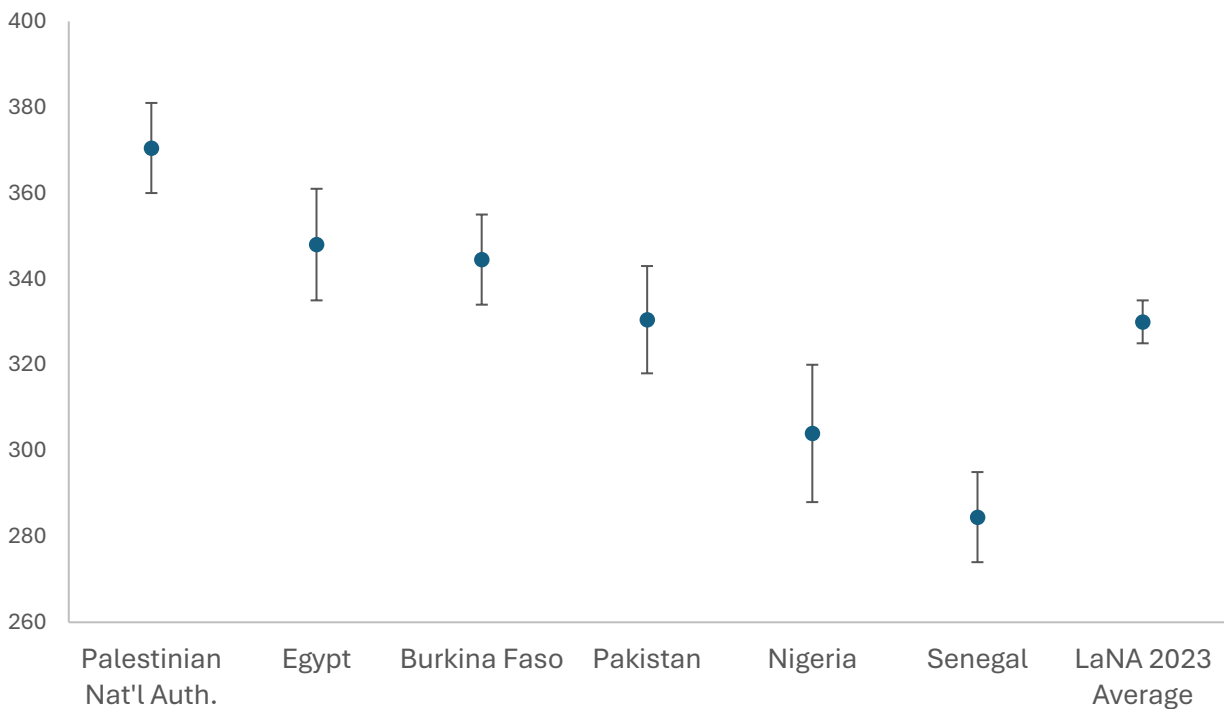
Pakistan in the global context

The 2023 LaNA exercise took place in five countries: Egypt, Palestinian National Authority, Pakistan, Nigeria, Burkina Faso and Senegal. This wide range of geographies allow for the comparison of the performance of the education system of these countries. In this context, Pakistan has an average performance as compared to the other countries in this exercise. The reading score of children in Pakistan had a higher point estimate than children in Senegal and Nigeria, while their point estimate was below that of children in Burkina Faso, Egypt and the Palestinian National Authority (as shown in Table 4 and Graph 1 below).

Table 4: Average Reading Scores across countries

Country	95 % Confidence Interval for Average Reading Scale Score
Palestinian Nat'l Auth.	360 - 381
Egypt	335 - 361
Burkina Faso	334 - 355
Pakistan	318 - 343
Nigeria	283 - 320
Senegal	274 - 295
LaNA 2023 Average	325 - 335

Graph 1: Average Reading Scores across countries

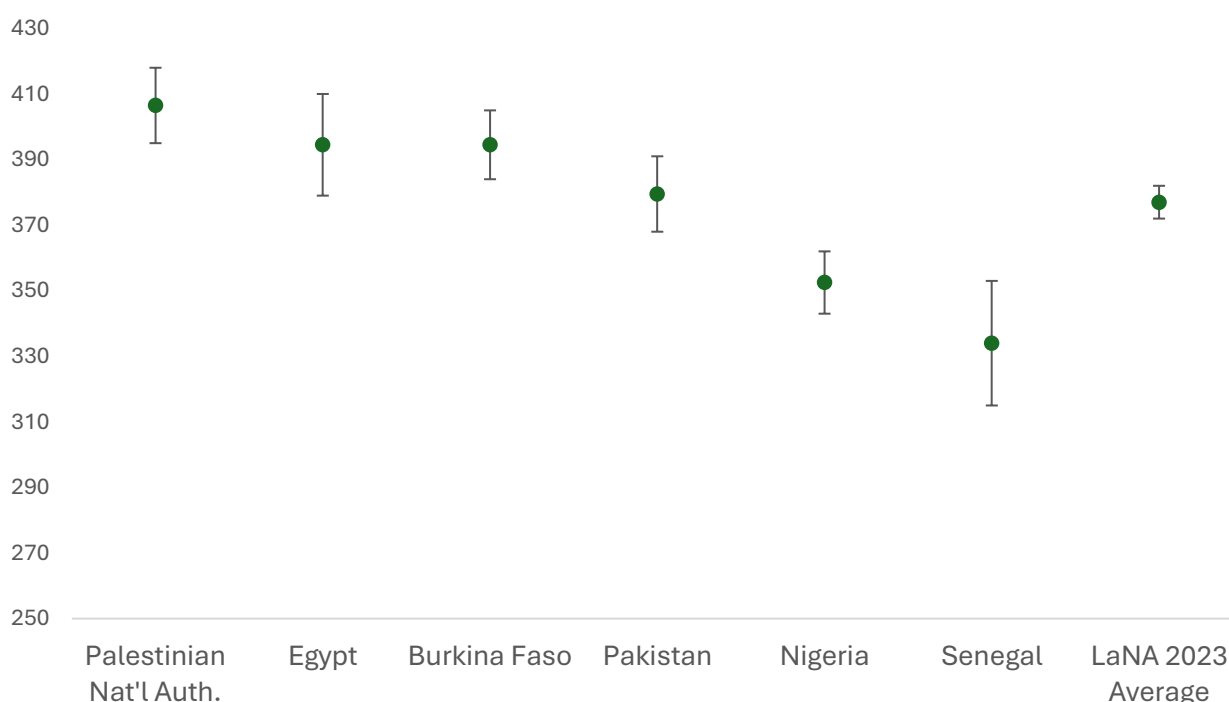


Similarly, in the mathematics examination the students in Pakistan had an average performance compared to the other countries that participated. The midpoint average score that Pakistani students is higher than that of Senegal and Nigeria in this subject. Moreover, the graph shows that there is no juxtaposition between the confidence intervals of Pakistani children and those from Nigeria and Senegal, implying that the difference between these countries is statistically significant. On the other side, Pakistani students had a lower average point score than students from Burkina Faso, Egypt and the Palestinian National Authority. In this case, only the difference between Palestinian and Pakistani students is statistically significant.

Table 5: Average Mathematics Scores across countries

Province	95 % Confidence Interval for Average Mathematics Scale Score
Palestinian Nat'l Auth.	395 - 418
Egypt	379 - 410
Burkina Faso	384 - 405
Pakistan	368 - 391
Nigeria	343 - 362
Senegal	315 - 353
LaNA 2023 Average	372 - 382

Graph 2: Average Mathematics Scores across countries



Later sections of the report look at contextualising these results and provide with further information on how different factors influence the assessment scores of students in Pakistan and the provinces that form this country.

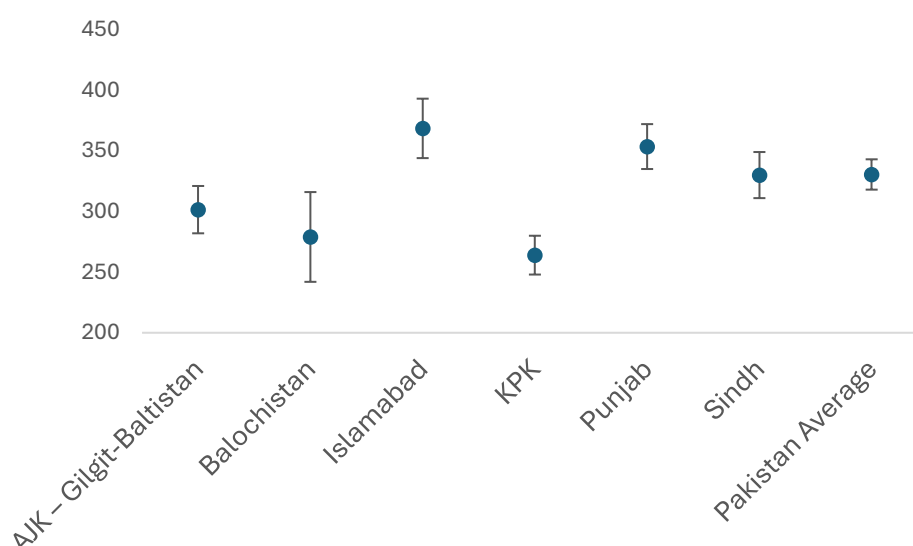
Literacy Achievement (by province)

The literacy component of the assessment examines children's reading abilities. Table 6 shows a summary of the 95 percent confidence intervals that children in different provinces of Pakistan obtained in this assessment. Out of the six territorial divisions, Islamabad is the territory that had the highest overall performance in the test, with a confidence interval that goes from 344 to 393 points, followed by the province of Punjab with a confidence interval that goes from 335 to 372 points in this examination. On the other side, children in Balochistan had the one of the lowest scores with confidence intervals that go from 242 to 316 points and followed by children in KPK with a confidence interval that goes from 248 to 280 points. Overall, these results show the notable differences in educational achievement between the different provinces of Pakistan.

Table 6: Average Reading Scale by province

	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	3 (0.2)	282-321
Balochistan	5 (0.5)	242-316
Islamabad	1 (0.1)	344-393
KPK	16 (1.1)	248-280
Punjab	59 (1.6)	335-372
Sindh	16 (1.3)	311-349
Pakistan Average	-	318-343

Graph 3: Average Reading Scores across provinces



Literacy Achievement (by province and gender)

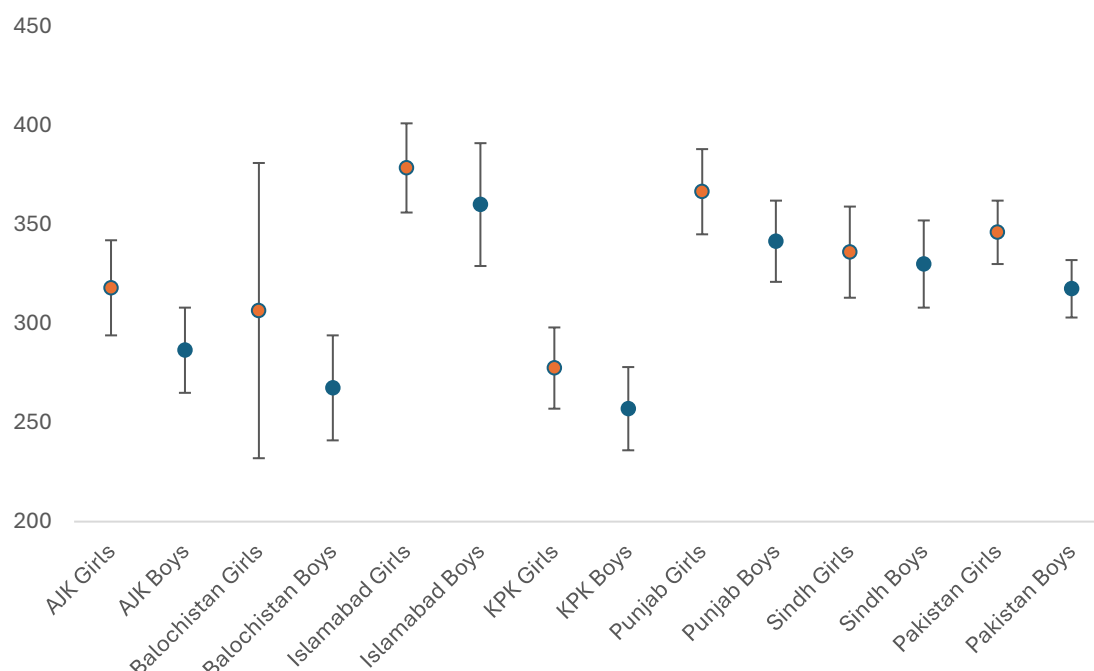
Historically, the percentage of girls that have participated in education in Pakistan is lower than the percentage of boys. Table 7 shows the distribution of girls and boys amongst the sample used for this exercise. In this sample, the percentage of girls out of the total population is 46 percent whereas boys represent 54 percent of all the assessed students. There are, important differences between provinces. The data shows that the school participation of girls in Balochistan stands at 31 percent versus 69 percent of boys, while other provinces like Punjab or Islamabad have equal proportion of students based on gender.

The 95 percent confidence interval of these two genders show that girls, with an interval that goes from 330 to 362 have higher average reading scores than boys where their respective interval goes from 303 to 332. As shown in Graph 4, the average midpoint of average reading scores for girls is higher than that of boys for all the provinces of Pakistan. This is in line with what other assessments that took place in Pakistan (LaNA, EGRA, NAT, etc) have found. The confidence intervals, however, overlap in all the regions which indicates that the difference between the two groups is not significant. It is important to note the large confidence interval shown for girls from Balochistan, implying a wider range of performance for this subset of the population as well as a smaller representation driven by a smaller presence of girls in schools in this province.

Table 7: Average Reading Scale Score by province and gender

	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan		
Girls	47 (4.9)	294-342
Boys	53 (4.9)	265-308
Balochistan		
Girls	31 (5.9)	232-381
Boys	69 (5.9)	241-294
Islamabad		
Girls	50 (3.5)	356-401
Boys	50 (3.5)	329-391
KPK		
Girls	36 (5.3)	257-298
Boys	64 (5.3)	236-278
Punjab		
Girls	50 (3.9)	345-388
Boys	50 (3.9)	321-362
Sindh		
Girls	45 (4.1)	313-359
Boys	55 (4.1)	308-352
Pakistan Average		
Girls	46 (2.6)	330-362
Boys	54 (2.6)	303-332

Graph 4: Average Reading Scores by provinces and gender



Literacy Achievement (by province and school location)

Pakistan is a vast country where different economic and social realities coexist. Table 8 below shows how children that took the test perform in the reading examination based on their school location: urban-densely populated, suburban-on fringe or outskirts of urban area, medium size city or large town, small town village or remote rural. Out of all students that were tested in this exercise, 21 percent went to a school located in a “urban-densely populated” area, 3 percent were in “suburban-on fringe or outskirts of urban area”, 20 percent in “medium size city or large town”, 42 percent in “small town village” and 14 percent in a “remote rural” area.

To get an illustrative idea of the difference in performance between these groups, Graph 5 looks at the confidence intervals of the reading scores of students coming from urban areas, medium cities and remote areas. Overall, students that go to school located in an urban area perform better in the reading examination than those from schools in medium towns. Students going to schools in remote areas are the ones that have the lowest point average scores of all the groups analysed. This pattern is present in all the provinces of Pakistan except Balochistan, where the average reading score point for students from medium towns is slightly higher than those from urban areas. At the national, the confidence intervals of these three groups overlap, implying that there are no significant differences between the reading scores of students based on school location. On the other side, at the provincial level, we also see this pattern with one exception: students from the urban areas of Islamabad perform better than their rural counterparts and this difference is statistically significant.

Graph 5: Average Reading Achievement Score by province and school location

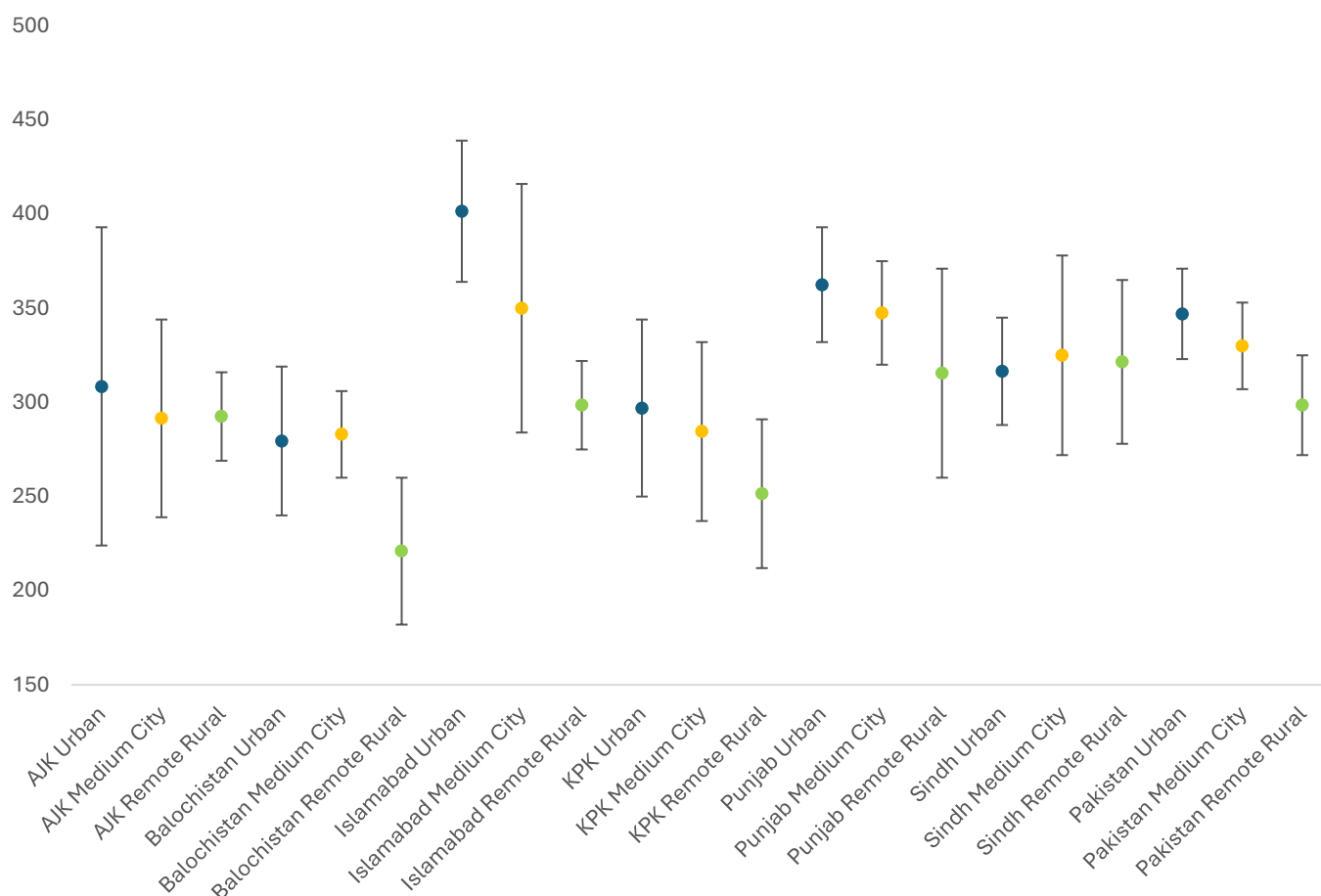


Table 8 provides a more detailed analysis of the difference between student performance based on school location. The 95 percent interval for reading scores for students in urban-densely populated areas goes from 323 to 371, for suburban-on fringe or outskirts of urban area goes from 284 to 392, for medium size city or large town goes from 307 to 353, for small town village goes from 313 to 351 and for remote rural areas goes from 272 to 325. As discussed above, while students in urban centres have a higher performance point than those in rural areas, the overlapping confidence intervals of these groups means that this difference is not significant.

Table 8: Average Reading Scale Score by province and location

Province	Urban-Densely Populated		Suburban-On Fringe or Outskirts of Urban Area		Medium Size City or Large Town		Small Town Village		Remote Rural	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	9 (4.6)	224-393	3 (1.9)	218-344	12 (6.0)	239-344	50 (7.0)	282-336	26 (6.0)	269-316
Balochistan	11 (3.8)	240-319	5 (4.1)	229-283	36 (8.5)	260-306	30 (9.1)	196-425	18 (5.0)	182-260
Islamabad	47 (9.2)	364-439	10 (4.6)	313-350	16 (5.4)	284-416	18 (9.6)	295-414	9 (3.7)	275-322
KPK	14 (4.6)	250-344	6 (3.8)	241-285	15 (6.0)	237-332	50 (6.4)	229-276	15 (4.1)	212-291
Punjab	25 (6.0)	332-393	3 (1.8)	385-406	21 (6.0)	320-375	40 (6.4)	335-384	11 (4.1)	260-371
Sindh	18 (4.0)	288-345	1 (1.5)	-	21 (7.2)	272-378	41 (9.0)	320-361	19 (6.9)	278-365
Pakistan Average	21 (3.7)	323-371	3 (1.3)	284-392	20 (3.9)	307-353	42 (4.3)	313-351	14 (2.8)	272-325

Literacy Achievement (by province and school type)

The private education sector in Pakistan has been increasing in importance during the past decades and now it provides education to nearly half of primary students in the country. Graph 6 showcases the difference in the reading scores between students that attend a private school and those that attend a public school. As illustrated, the average point score of the reading assessment is higher for students that go to private schools than those that go to public schools. This difference, however, it is not statistically significant at the national level since their confidence intervals overlap. At the provincial level the only provinces where the difference is statistically significant are Islamabad and KPK (Table 9 below shows these values in more detail).

Graph 6: Average Reading Achievement Score by province and school type

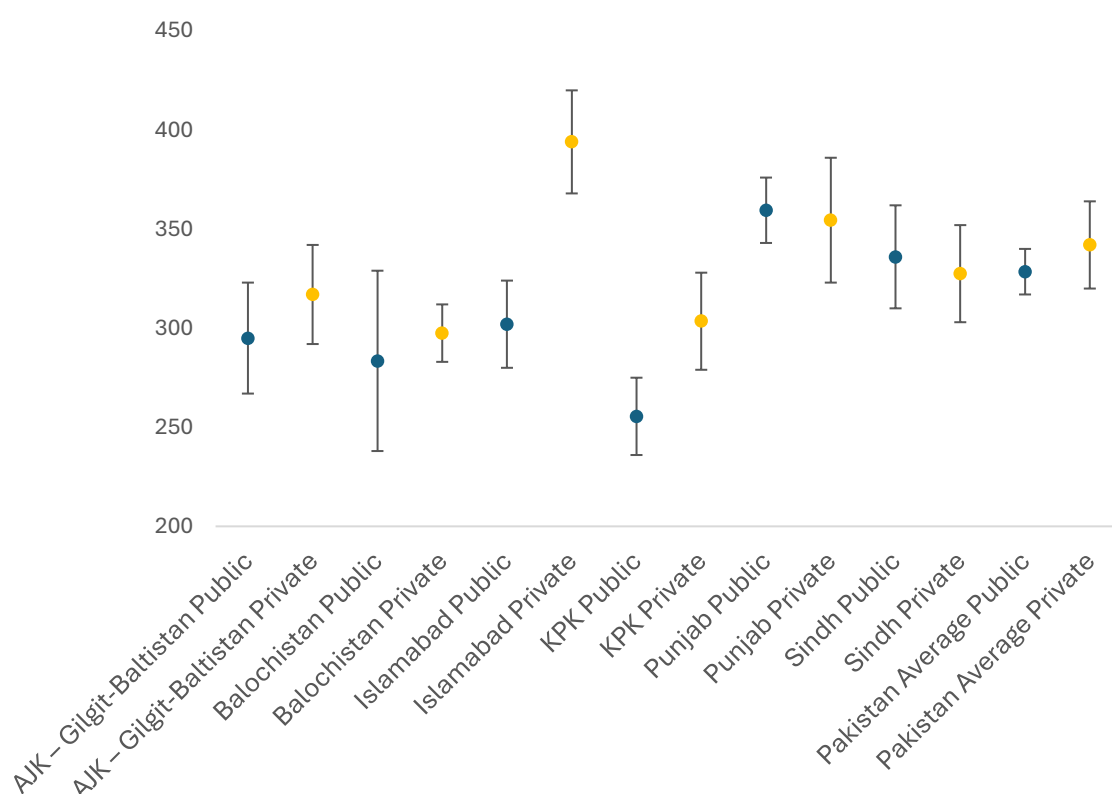


Table 9: Average Reading Scale Score by province and school type

Province	Public Schools		Private Schools	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	56 (3.5)	267-323	44 (3.5)	292-342
Balochistan	68 (4.0)	228-329	32 (4.0)	254-312
Islamabad	24 (3.1)	280-324	75 (3.1)	368-420
KPK	70 (2.3)	236-274	30 (2.3)	279-327
Punjab	53 (2.4)	343-376	47 (2.4)	323-386
Sindh	65 (3.4)	310-362	35 (3.4)	303-352
Pakistan Average	58 (1.8)	317-340	42 (1.8)	320-364

Mathematics Achievement (by province)

This section looks at the performance of students in the Mathematics achievement test in each province of Pakistan. Graph 7 illustrates how each province performed using midpoints and their respective confidence intervals. As it can be seen, Islamabad Capital Territory has the highest midpoint, followed by Punjab and AJK/ Gilgit-Baltistan. All these provinces have an average midpoint equal or higher than that of the average Pakistani student. On the other side, Balochistan and KPK are the provinces with the lowest average midpoint while Sindh average appears to be slightly below the national average for this subject. In terms of their significance, the graph shows that there is no overlap between the confidence intervals of the highest performing provinces (Islamabad and Punjab) and those that had the lowest performance (Balochistan, KPK and Sindh). This indicates that there is a statistically significant difference in the mathematics scores obtained from the students going to school in the high performing provinces and those attending school in the low performing schools.

Table 10 showcases these important differences with numbers. Balochistan has the lowest scores with a confidence interval that goes from 284 to 362, closely followed by Khyber Pakhtunkhwa with a confidence interval that goes from 310 to 341 points. On the other side, the two provinces that have highest scores are the Islamabad with a 95 percent confidence interval that goes from 410 to 459 and Punjab that has a confidence interval that goes from 387 to 421.

Graph 7: Average Mathematics Scale Score by province

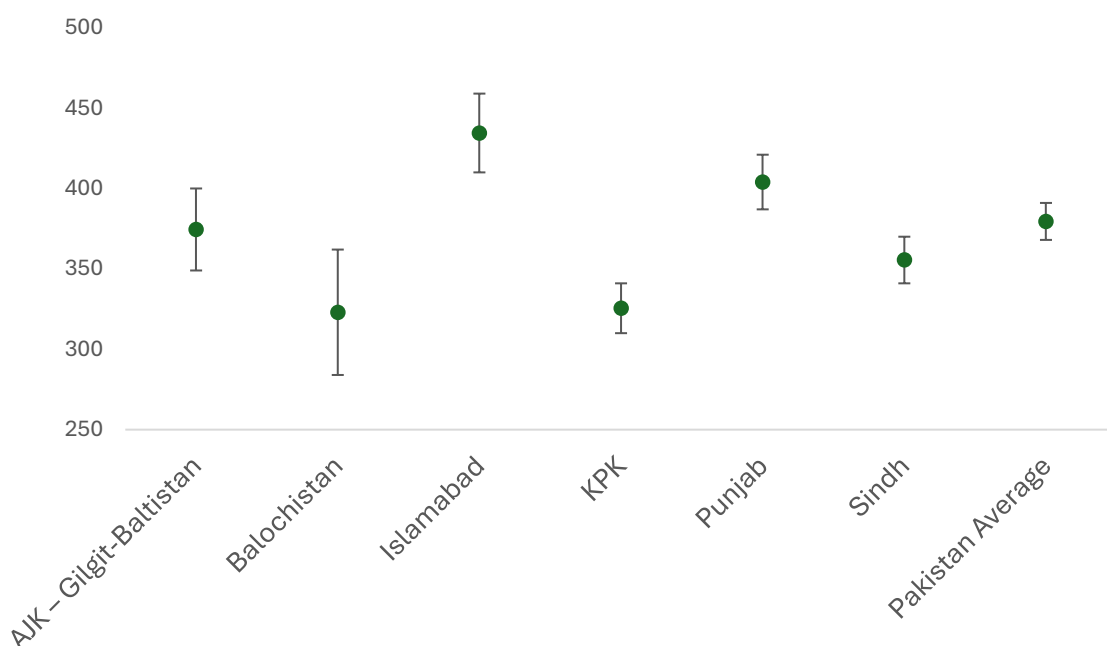


Table 10: Average Mathematics Scale Score by province

	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	3 (0.2)	349-400
Balochistan	5 (0.5)	284-362
Islamabad	1 (0.1)	410-459
KPK	16 (1.1)	310-341
Punjab	59 (1.6)	387-421
Sindh	16 (1.3)	346-375
Pakistan Average	-	368-391

Mathematics Achievement (by province and gender)

This section looks at the different performance between girls and boys in the mathematics assessment. Graph 8 illustrates these differences by province. Overall, it can be seen at the national level girls have a higher midpoint average than boys. At the provincial level, the results show that girls have a higher midpoint average score than boys in all provinces except for KPK where boys perform better than girls. With regards to the significance of these differences, the graph shows that there is not an overlap on boys scores between the best performing provinces (Islamabad and Punjab) and the worse performing regions (Balochistan, Sindh and KPK). This implies that there is a statistically significant difference between these groups of students. For girls, however, the confidence intervals are much wider (specially in Balochistan) and therefore the confidence intervals of this province do overlap with the confidence intervals of high performing. Therefore, the data fails to reject a statistically significant difference between in mathematics scores of Balochi girls and other provinces such as Punjab or Islamabad. Nonetheless, there are statistically significant differences between the mathematics scores of girls in Islamabad and Punjab and those from KPK.

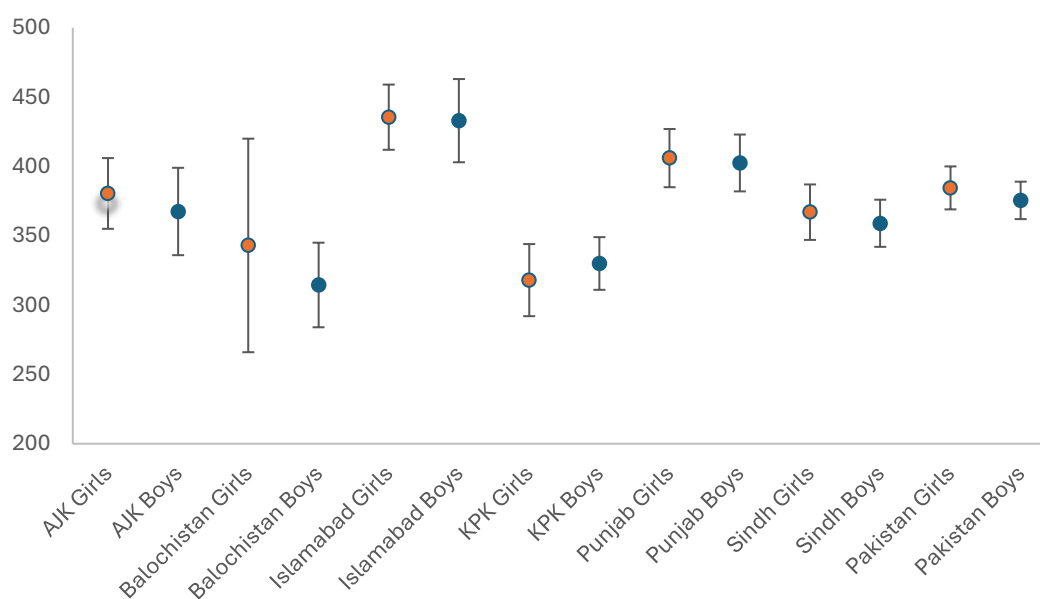
Graph 8: Average Mathematics Scores by Province and Gender

Table 11 provides more detailed information on the scores obtained by gender and province. Overall, 54 percent of the students included in this study were boys and 46 percent were girls, which showcase a larger presence of boys in schools in Pakistan. There are significant variations between provinces; Punjab is the province that has a 50:50 ratio between boys and girls while Balochistan, where girls are only 31 percent of their total student population is the province with the lowest representation of girls in the education system. With regards to their performance, the 95 percent confidence interval of reading scores for girls goes from 369 to 400. The 95 percent confidence interval for boys is slightly lower than that of girls and goes from 362 to 389.

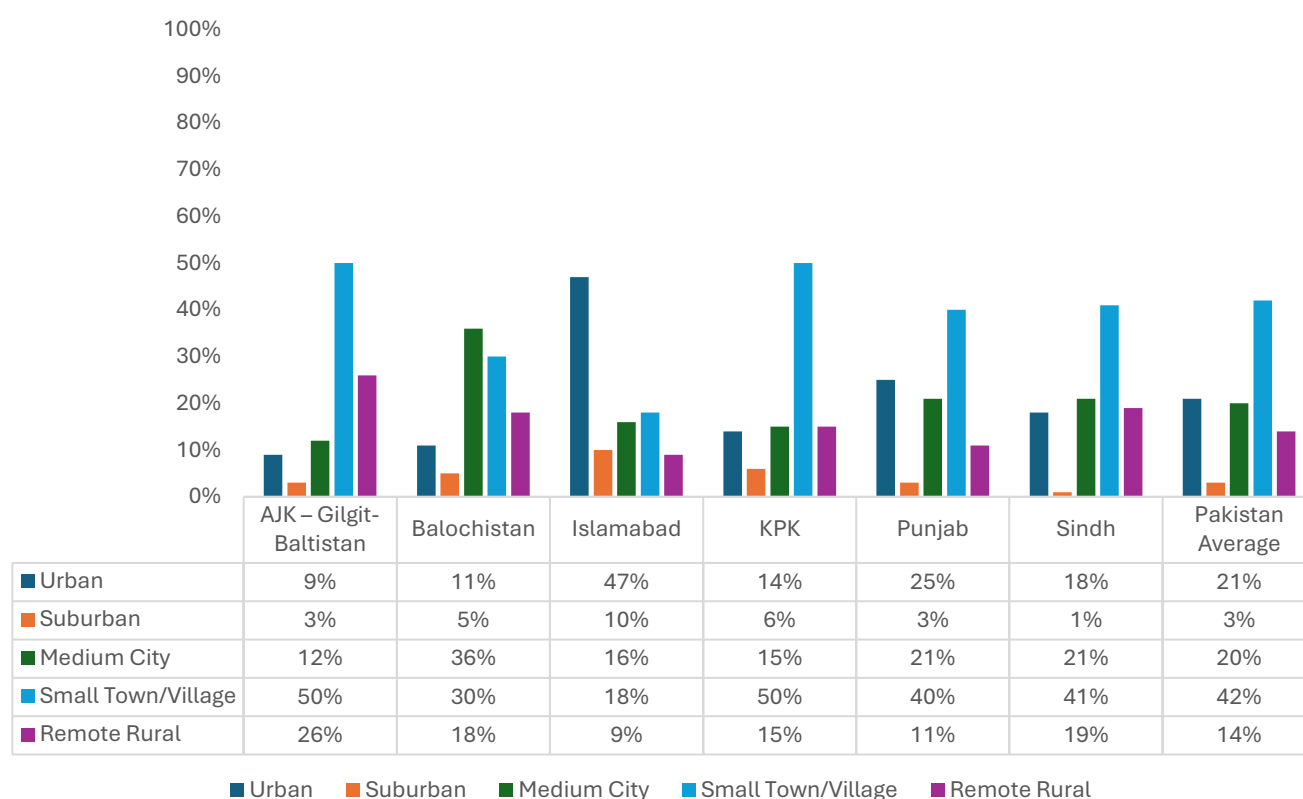
Table 11: Average Mathematics Scale Score for Girls and Boys

	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan		
Girls	47 (4.9)	355-406
Boys	53 (4.9)	336-399
Balochistan		
Girls	31 (5.9)	266-420
Boys	69 (5.9)	284-345
Islamabad		
Girls	50 (3.5)	412-459
Boys	50 (3.5)	403-463
KPK		
Girls	36 (5.3)	292-344
Boys	64 (5.3)	311-349
Punjab		
Girls	50 (3.9)	385-427
Boys	50 (3.9)	382-423
Sindh		
Girls	45 (4.1)	347-387
Boys	55 (4.1)	342-376
Pakistan Average		
Girls	46 (2.6)	369-400
Boys	54 (2.6)	362-389

Mathematics Achievement (by province and school location)

Graph 9 shows the percentage of students from each province that belonged to each of the school location types. At the national level, 21% of the students that participated in this exercise were from an “urban-densely populated area, 3 percent in a “suburban-on fringe or outskirts of urban area”, 20 percent were in “medium size or large town”, 42 percent were in a “small town” and 14 percent were in a “remote rural” area. Nonetheless, there are notable differences by province. While Islamabad and Punjab have the highest percentage of the students that participated living in urban areas, Balochistan, Sindh and AJK/Gilgit-Baltistan are the provinces with the highest percentage of students that participated in this study living in rural remote areas.

Graph 9: Percentage of students based on school location (%)



To analyse the respective performance of each province, it is key to look at the confidence intervals of the scores obtained by students in each of groups. Graph 10 compares the 95% confidence intervals for the mathematics scores of students based on the location of their school. For simplicity, only the major groups (urban, medium city and rural remote areas) have been included. As expected, students going to schools in urban areas have a higher average point than those attending schools in medium cities and those students in rural areas have the lowest average point amongst the groups analysed. With regards to the significance of these differences, at the national level there is no overlap between the 95 confidence intervals of urban students and rural students. This implies that there the difference in scores between these two groups is statistically significant at the Pakistan level. At the provincial level, however, we see that most of the confidence intervals of these groups overlap, suggesting that there are not statistically significant differences between students of these three different groups.

For more granular detail, Table 12 displays the confidence intervals of the five groups in which students have been divided based on the location of their schools. The 95 percent confidence interval of the mathematics scores of students in urban-densely populated areas goes from 379 to 431 score points. Similarly, the scores of those living in suburban-on fringe or outskirts of urban area goes from 332 to 420 score points. For students in medium size cities or large towns the interval goes from 355 to 407 score points. Finally, the students in small town villages and remote rural areas had intervals that went from 362 to 393 and 322 to 373 score points respectively.

Graph 10: Average Mathematics Scale Score based on school location

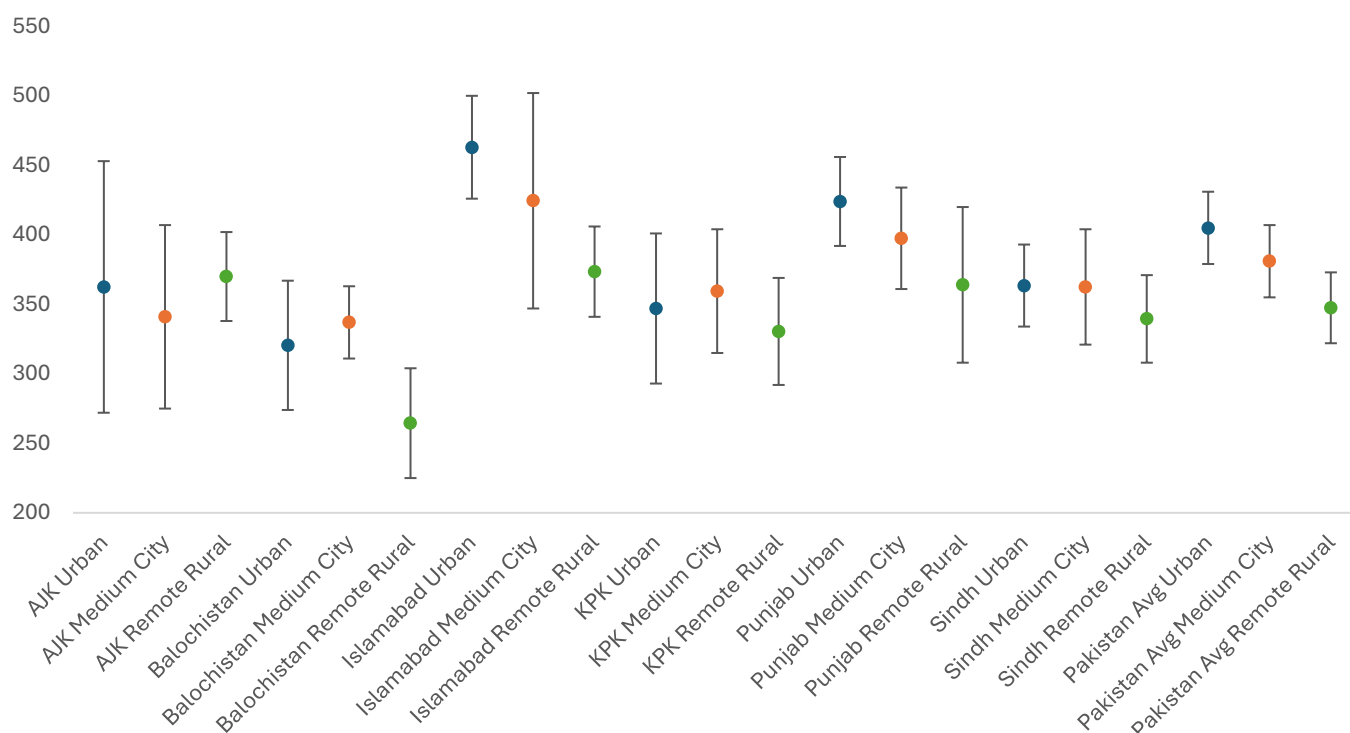


Table 12: Average Mathematics Scale Score based on school location

Province	Urban-Densely Populated		Suburban-On Fringe or Outskirts of Urban Area		Medium Size City or Large Town		Small Town Village		Remote Rural	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	9 (4.6)	272-453	3 (1.9)	309-393	12 (6.0)	275-407	50 (7.0)	350-425	26 (6.0)	338-402
Balochistan	11 (3.8)	274-367	5 (4.1)	188-411	36 (8.5)	311-363	30 (9.1)	226-464	18 (5.0)	225-304
Islamabad	47 (9.2)	426-500	10 (4.6)	382-423	16 (5.4)	347-502	18 (9.6)	365-470	9 (3.7)	341-406
KPK	14 (4.6)	293-401	6 (3.8)	262-358	15 (6.0)	315-404	50 (6.4)	280-338	15 (4.1)	292-369
Punjab	25 (6.0)	392-456	3 (1.8)	356-473	21 (6.0)	361-434	40 (6.4)	387-424	11 (4.1)	308-420
Sindh	18 (4.0)	334-393	1 (1.5)	-	21 (7.2)	321-400	41 (9.0)	348-381	19 (6.9)	308-371
Pakistan Average	21 (3.7)	379-431	3 (1.3)	332-420	20 (3.9)	355-407	42 (4.3)	362-393	14 (2.8)	322-373

Mathematics Achievement (by province and school type)

Graph 11 showcases the difference in the mathematics scores between students that attend a private school and those that attend a public school. As illustrated, the average point score of the mathematics assessment is higher for students that go to private schools than those that go to public schools. This difference is statistically significant at the national level since the confidence intervals of these two groups do not overlap. At the provincial level the only provinces where the difference is statistically significant are Islamabad and KPK (Table 13 below shows these values in more detail).

Graph 11: Average Mathematics Scale Score based on school type

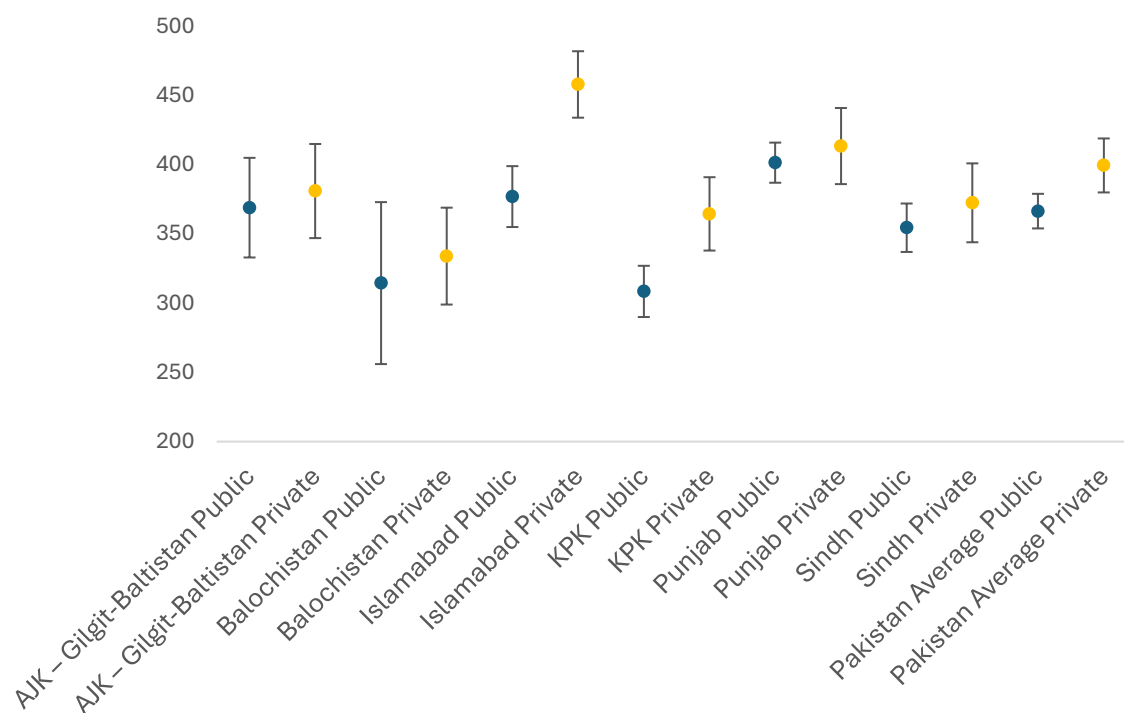


Table 13: Average Mathematics Scale Score based on school type

Province	Public Schools		Private Schools	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	56 (3.5)	333-405	44 (3.5)	347-415
Balochistan	68 (4.0)	262-373	32 (4.0)	299-369
Islamabad	24 (3.1)	345-399	75 (3.1)	425-482
KPK	70 (2.3)	290-327	30 (2.3)	338-391
Punjab	53 (2.4)	377-416	47 (2.4)	386-441
Sindh	65 (3.4)	336-372	35 (3.4)	354-401
Pakistan Average	58 (1.8)	354-379	42 (1.8)	380-419

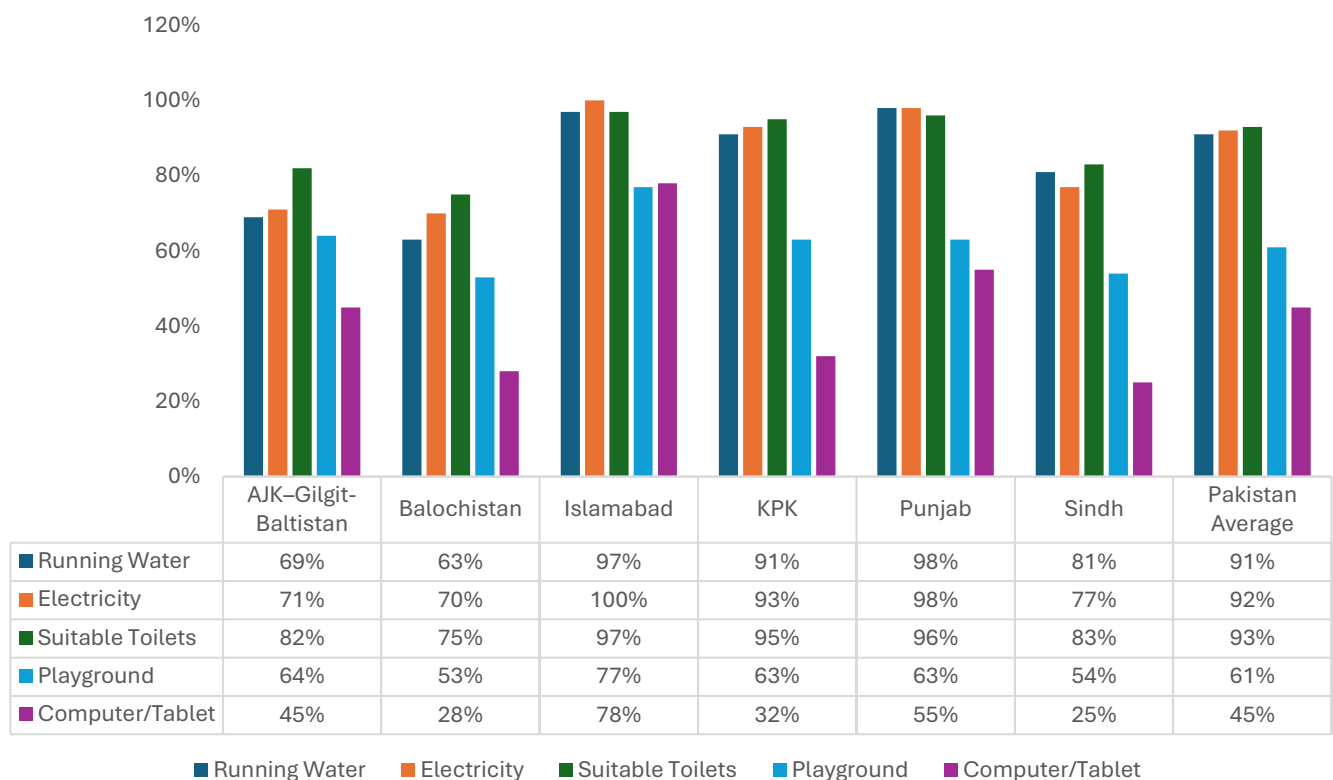
School Contexts

The LaNA 2023 Linking study collected information on some school metrics through a questionnaire that was administered to school principals. These questions aimed at collecting information about the facilities of the school and the classrooms. In this section, the students are divided into groups based on the responses obtained in these questionnaires and their scores are compared.

Graph 12 showcases the percentage of students that go to a school with running water, electricity, suitable toilets, playground or computer/tablets. Overall, we see that 91 percent of the students in Pakistan go to a school with running water, 92 percent of them go to a school with electricity, 93 percent of them go to a school with suitable toilets, 64 percent of them go to a school with a playground and 45 percent go to a school with a tablet/computer.

There are, however, notable differences between different provinces. For running water, Punjab is the province with highest percentage of students that go to a school with running water with 98 percent while Balochistan is the province with the lowest percentage of students that go to a school with running water with 63 percent. Similarly, 55 percent of students in Punjab go to a school with a computer or tablet while this percentage is only 25 percent in Sindh.

Graph 12: Percentage of Students Attending Schools with Key Resources by Province



School Resources (I)

Graph 13 displays the difference in confidence intervals between students that go to schools with water, electricity and usable toilets and those that go to schools without these facilities. For all the variables observed, the average point for those students that go to a school with water, electricity or toilets are higher than those students that go to school without these resources. The 95 percent confidence intervals of these two groups overlap, implying that there are no significant differences between the reading scores of these groups. For more detailed

information at the provincial level, Table 14 provides the confidence intervals of all the groups discussed.

Graph 13: Average Reading Scale Score based on School Resources (I)

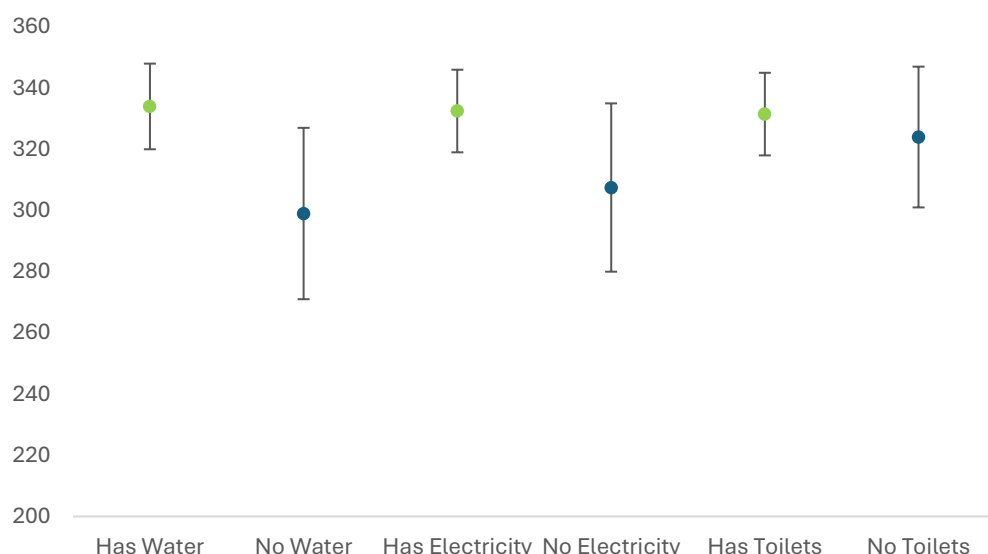


Table 14: Average Reading Scale Score based on province and school resources (I)

Province	Running Water			Electricity			Suitable Toilets		
	% Students	95% Confidence Interval for		% Students	95% Confidence Interval for		% Students	95% Confidence Interval for	
		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	69 (4.4)	290-335	247-316	71 (6.3)	283-326	257-334	82 (5.7)	281-321	255-353
Balochistan	63 (9.9)	243-281	213-400	70 (10.2)	240-281	211-434	75 (9.8)	235-274	229-470
Islamabad	97 (2.4)	346-395	284-345	100 (0.0)	344-393	-	97 (2.4)	346-396	153-425
KPK	91 (4.2)	250-285	201-274	93 (4.9)	251-281	193-276	95 (3.2)	247-280	170-393
Punjab	98 (1.4)	335-373	285-426	98 (1.6)	335-373	-	96 (2.3)	336-373	300-365
Sindh	81 (7.6)	317-358	273-336	77 (7.8)	311-354	295-348	83 (6.7)	309-353	298-351
Pakistan Average	91 (1.7)	320-348	271-327	92 (1.8)	319-346	280-335	93 (1.9)	318-345	301-347

For Mathematics there is a similar pattern as the one shown in the reading assessment. The average point score of those students going to schools where there is a water, electricity or usable toilets is higher than those students going to schools where these facilities are not available. The confidence intervals of these two groups overlap, implying that there are not significant differences between the groups analysed at the national level. For more detailed provincial insights, Table 15 provides information on the confidence intervals is displayed.

Graph 14: Average Mathematics Scale Score based on School Resources (I)

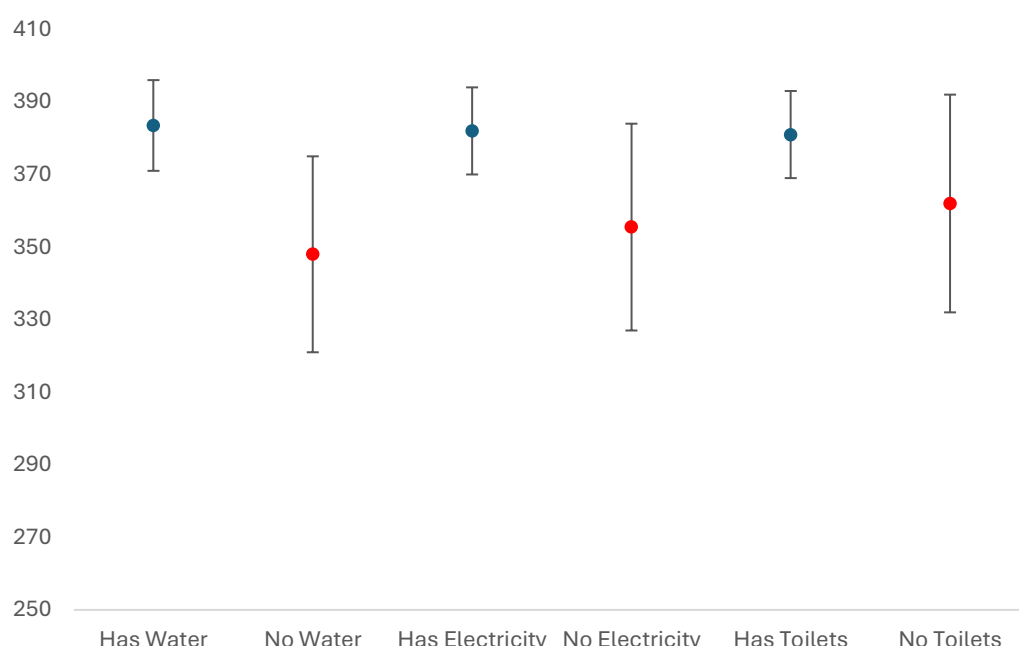


Table 15: Average Mathematics Scale Score based on School Resources (I)

Province	Running Water			Electricity			Suitable Toilets		
	% Students	95% Confidence Interval for Average Achievement		% Students	95% Confidence Interval for Average Achievement		% Students	95% Confidence Interval for Average Achievement	
		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"
AJK - Gilgit-Baltistan	69 (4.4)	354-410	308-413	71 (6.3)	346-401	322-428	82 (5.7)	346-397	325-447
Balochistan	63 (9.9)	287-332	249-441	70 (10.2)	283-331	245-474	75 (9.8)	276-324	272-509
Islamabad	97 (2.4)	412-461	290-469	100 (0.0)	410-459	-	97 (2.4)	411-461	225-504
KPK	91 (4.2)	311-345	266-334	93 (4.9)	307-341	278-387	95 (3.2)	307-340	251-467
Punjab	98 (1.4)	386-421	355-474	98 (1.6)	387-421	-	96 (2.3)	389-423	261-450
Sindh	81 (7.6)	352-382	317-360	77 (7.8)	350-381	317-369	83 (6.7)	346-379	328-373
Pakistan Average	91 (1.7)	371-396	321-375	92 (1.8)	370-394	327-384	93 (1.9)	369-393	332-392

School Resources (II)

The questionnaires asked principals whether their schools had playgrounds or access to computers and tablets. In the sample of Pakistan, the results show that 61 percent of the students went to a school where there was a playground and 45 percent have computer or tablets. For playground, there are important differences in availability between provinces; while Balochistan and Sindh report low levels of availability at 53 and 54 percent respectively, Islamabad and AJK/ Gilgit-Baltistan have higher levels of availability at 77 and 64 percent respectively. Similarly, in the case of computers and tablets in the classrooms, Sindh and Balochistan have the lowest percentage of availability in the classrooms with 25 and 28 percent respectively. On the other hand, Islamabad and Punjab have the highest percentage of students that have access to computer or tablets in their schools with 78 and 55 percent respectively.

Table 16 show the scores that students had against the availability of these school resources. The 95 percent confidence interval of reading scores of students that have a playground in their schools goes from 327 to 356 points while the confidence interval for those that do not have a playground goes from 296 to 330 points. For the computer and tablet question, those students that went to a school that had at least one of these available had a 95 percent

confidence interval of the scores that went from 332 to 356 while those that didn't have this resource in their classrooms had a confidence interval of 299 to 340. As it is illustrated in Graph 15, there is an overlap between the scores of those students going to schools with these resources and those that go to schools without these resources. This implies that there are no statistically significant differences between the reading scores of students that go to schools where there are playgrounds or computers/tablets and those that go to schools where these resources are not available.

Graph 15: Average Literacy Scale Score based on School Resources (II)

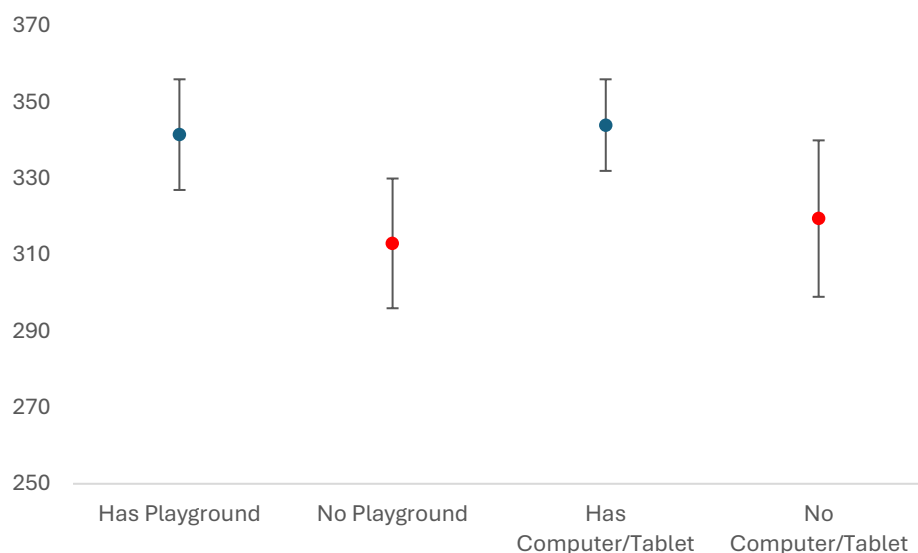


Table 16: Average Literacy Scale Score based on School Resources (II)

Province	Playground			Computer or Tablet		
	% Students	95% Confidence Interval for		% Students	95% Confidence Interval for	
		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	64 (6.9)	286-328	258-328	45 (7.1)	271-325	277-333
Balochistan	53 (7.7)	229-360	238-284	28 (6.1)	229-297	236-334
Islamabad	77 (7.8)	344-403	308-399	78 (6.9)	343-381	303-484
KPK	63 (8.2)	260-294	216-268	32 (6.6)	248-303	241-277
Punjab	63 (6.7)	351-384	305-355	55 (5.7)	346-373	310-383
Sindh	54 (8.9)	302-350	307-363	25 (3.8)	316-371	301-350
Pakistan Average	61 (4.5)	327-356	296-330	45 (3.8)	332-356	299-340

Table 17 displays how scores in the Mathematics assessment vary based on the availability of these resources. For schools that have a playground, the 95 percent confidence interval of mathematics scores of their students goes from 379 to 405 whereas the interval for those students at the schools that do not have a playground goes from 345 to 377. For the question about the availability of computers or tablets in the school, the 95 percent confidence interval of students that go to school with computers and tablets goes from 384 to 410 while the confidence interval for those who do not go to a school with these resources goes from 347 to 385. Graph 16 illustrates the differences in the confidence intervals of these two groups. For the groups that compares students based on the availability of playgrounds in their school, these confidence intervals do not overlap. This implies that there is a statistically significant difference in the mathematics scores of students that go to a school with a playground and

those that go to a school without a playground. On the other hand, the confidence intervals of students that go to school with computers or tablets overlap, implying that there is no statistically significant difference between these two groups.

Graph 16: Average Mathematics Scale Score based on School Resources (II)

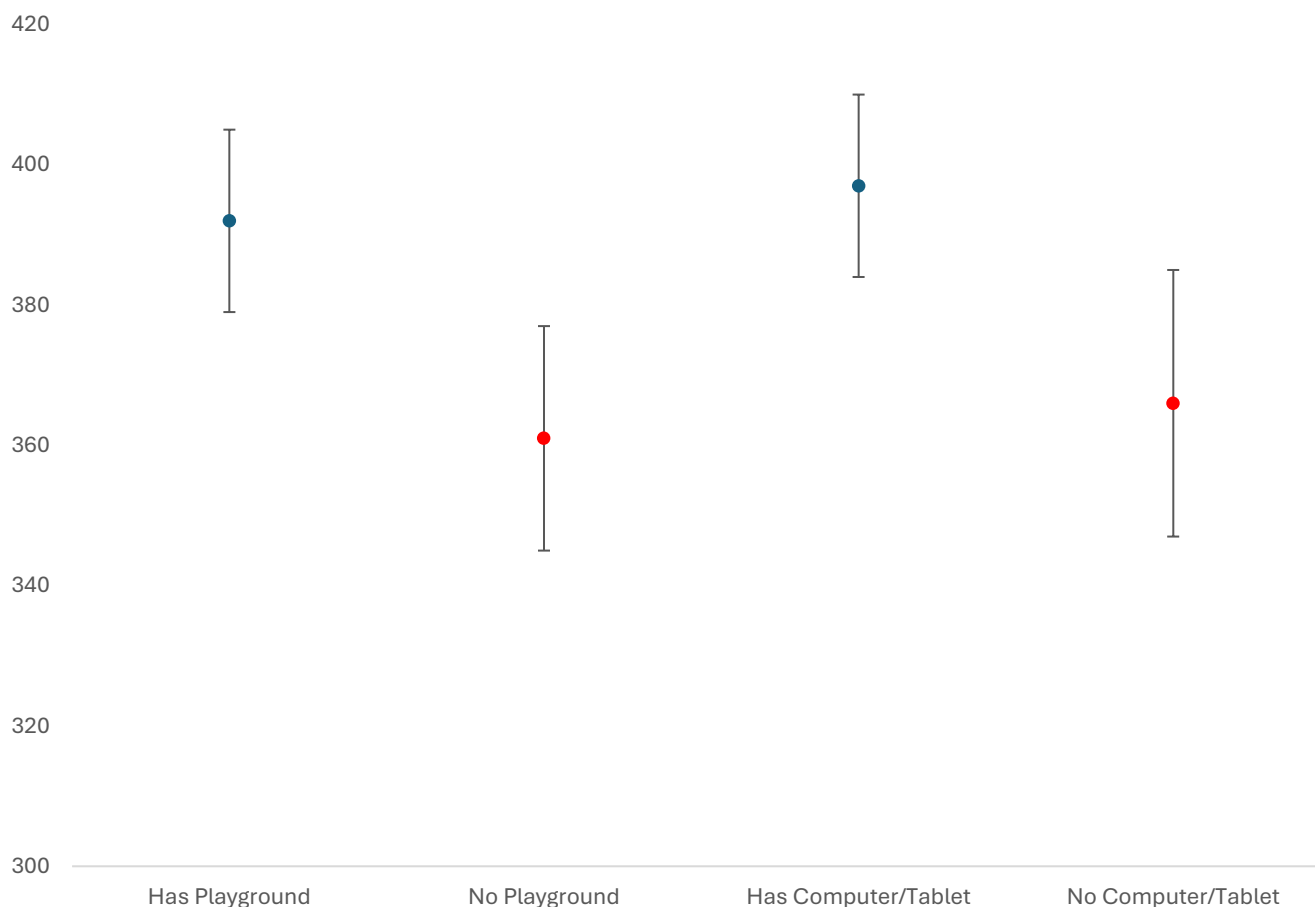


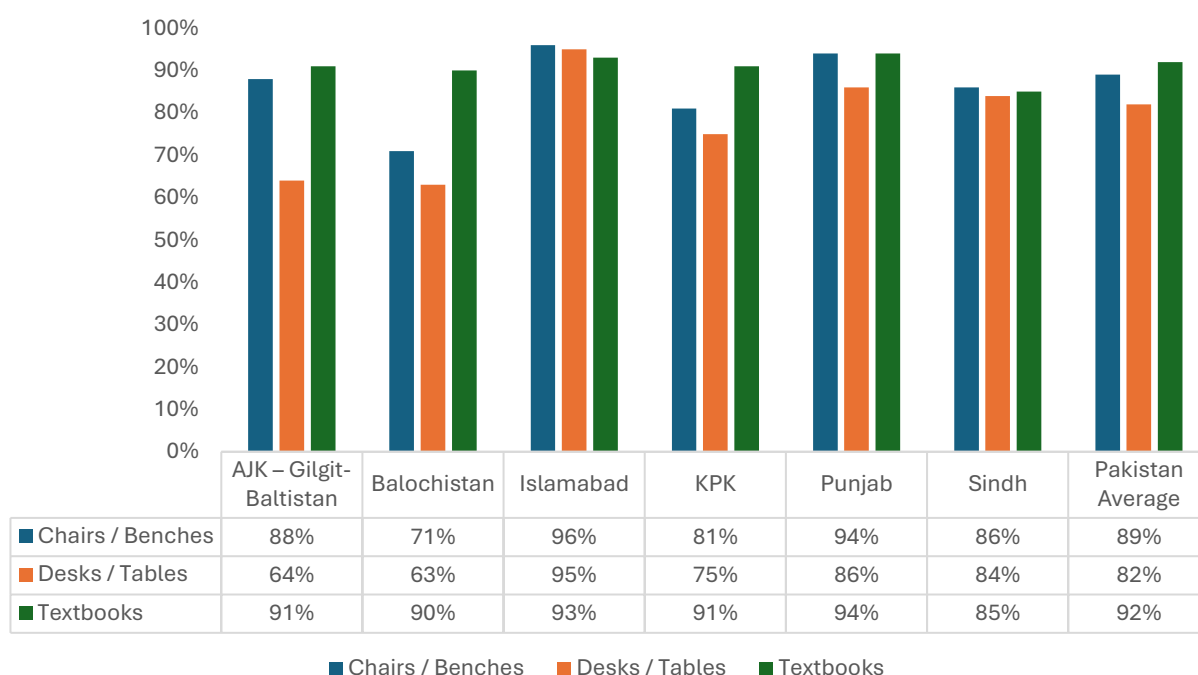
Table 17: Average Mathematics Scale Score based on School Resources (II)

Province	Playground			Computer or Tablet		
	% Students	95% Confidence Interval for Average Achievement		% Students	95% Confidence Interval for Average Achievement	
		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"
AJK - Gilgit-Baltistan	64 (6.9)	356-406	316-408	45 (7.1)	328-396	348-420
Balochistan	53 (7.7)	277-405	270-336	28 (6.1)	277-353	275-377
Islamabad	77 (7.8)	412-469	362-466	78 (6.9)	407-444	377-554
KPK	63 (8.2)	312-355	279-341	32 (6.6)	304-366	301-341
Punjab	63 (6.7)	404-433	355-404	55 (5.7)	395-426	363-429
Sindh	54 (8.9)	341-376	340-386	25 (3.8)	373-429	329-365
Pakistan Average	61 (4.5)	379-405	345-377	45 (3.8)	384-410	347-385

Classroom Resources

The school questionnaire incorporated questions that captured information about the resources available in the classroom for the students that participated in the LaNA exercise. Graph 17 looks at the equipment available in the classrooms of the schools where the examination took place. It mainly focuses on three groups of resources: chairs or benches, desks or tables and textbooks. Out of the students that participated in the assessment, 89 percent were in classes that had chairs or benches, 82 percent had desks or tables and 92 percent had textbooks. There are notable differences for these values between the provinces analysed. Islamabad is the area with the highest number of students going to schools with these classroom resources whereas Balochistan has the lowest percentage of students that go to a school with desks/tables or chairs/benches. Sindh is the province with the lowest percentage of students that have access to textbooks.

Graph 17: Provincial Distribution of Classroom Resources in Schools (% of Students)



Graph 18 illustrates the difference in confidence intervals of Pakistani students that go to a school with classroom facilities such as desk, chairs and textbooks and those that go to a school where these classroom facilities are not available. As displayed, students that go to a school where chairs or textbooks are available have a higher midpoint average score than those that go to a school where these are not available. On the other hand, the midpoint average score of those students that go to a school with a desk is lower than those students that go to a school where classrooms have desks. It is important to note that the confidence intervals across all the three groups discussed above overlap and therefore there is not a significant difference between the reading scores of these groups (as shown in more detail in Table 18).

Graph 18: Average Literacy Scale Score based on Classroom Resources

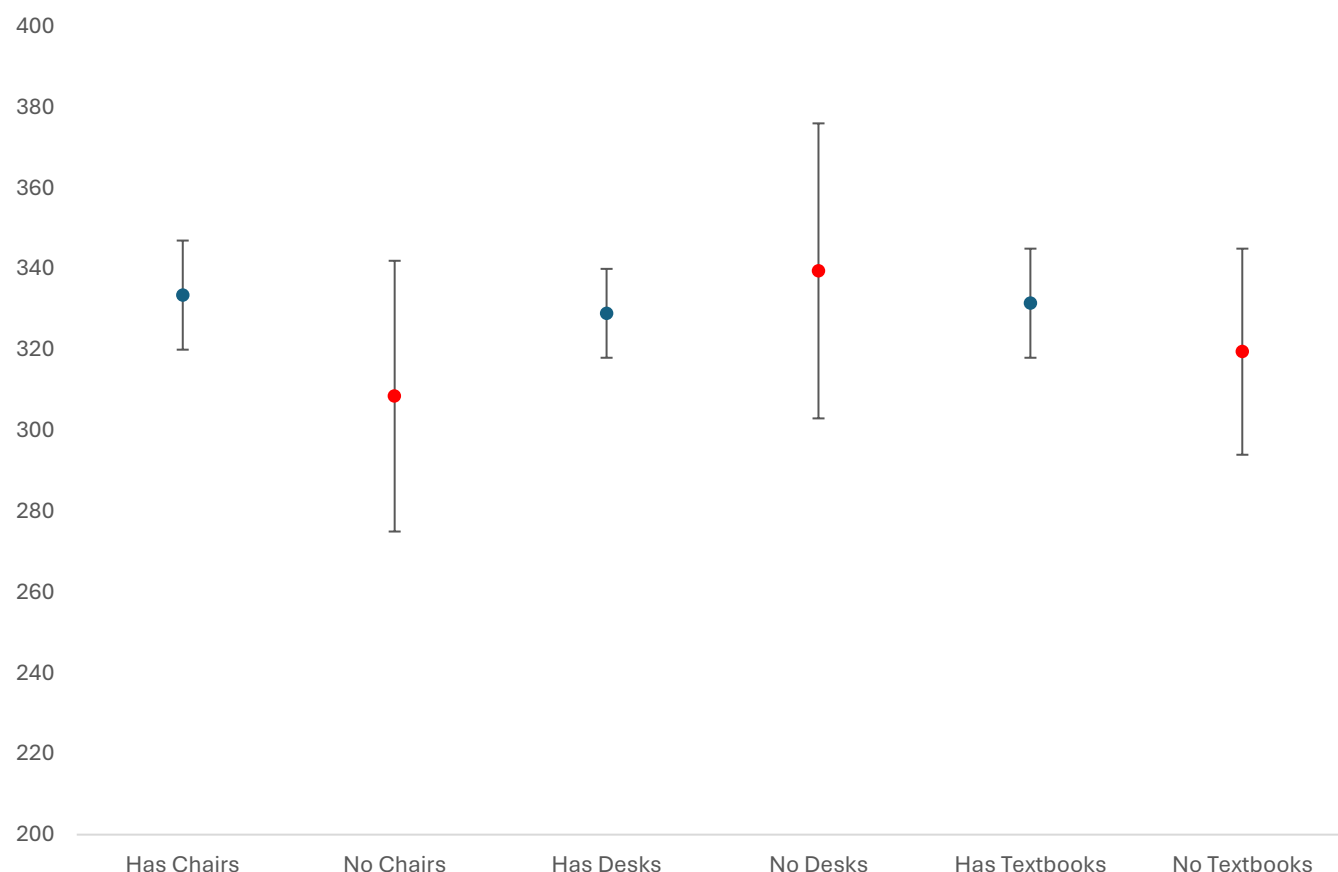


Table 18: Average Literacy Scale Score based on Classroom Resources

Province	Chairs or Benches			Desks or Tables			Textbooks		
	% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement		% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement		% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement	
		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"
AJK - Gilgit-Baltistan	88 (5.3)	282-324	239-345	64 (7.4)	289-338	254-308	91 (4.5)	283-320	189-417
Balochistan	71 (8.9)	233-277	226-447	63 (6.8)	243-285	206-404	90 (4.7)	237-323	185-346
Islamabad	96 (3.2)	345-395	257-406	95 (3.4)	346-396	274-387	93 (3.6)	348-399	253-346
KPK	81 (8.8)	251-282	214-297	75 (7.2)	247-280	229-304	91 (5.9)	245-278	172-415
Punjab	94 (2.9)	336-374	280-380	86 (5.4)	331-362	359-436	94 (2.8)	336-374	298-370
Sindh	86 (6.2)	310-349	273-397	84 (3.9)	312-354	274-354	85 (5.5)	310-351	298-354
Pakistan Average	89 (2.5)	320-347	275-342	82 (3.5)	318-340	303-376	92 (2.1)	318-345	294-345

Similar to the description above, Graph 19 illustrates the differences in the confidence intervals of the mathematics scores between students based on whether they go to schools where desks, chairs and textbooks are available versus those that go to a school where these classroom resources are not available. The 95 percent confidence interval for average achievement of students with chairs or benches in their classrooms goes from 372 to 396 versus the 321 to 374 interval of mathematics scores for those that did not have chairs or benches in their classrooms. Additionally, the 95 percent interval of average scores of students that went to classrooms with desks or tables goes from 368 to 389 while the interval is 355 to 420 for those students that do not have desks or tables in the classroom. Finally, those students that had textbooks in their classrooms had a 95 percent confidence interval of their scores that goes from 370 to 394 while those that did not have textbooks had a confidence

interval that goes from 327 to 390 average scores in the mathematics examination. As it is displayed in Graph 19, the confidence intervals of these groups overlap, which implies that there are no significant differences between the mathematics scores of these groups (more detailed provincial information is available in Table 19)

Graph 19: Average Mathematics Scale Score based on Classroom Resources

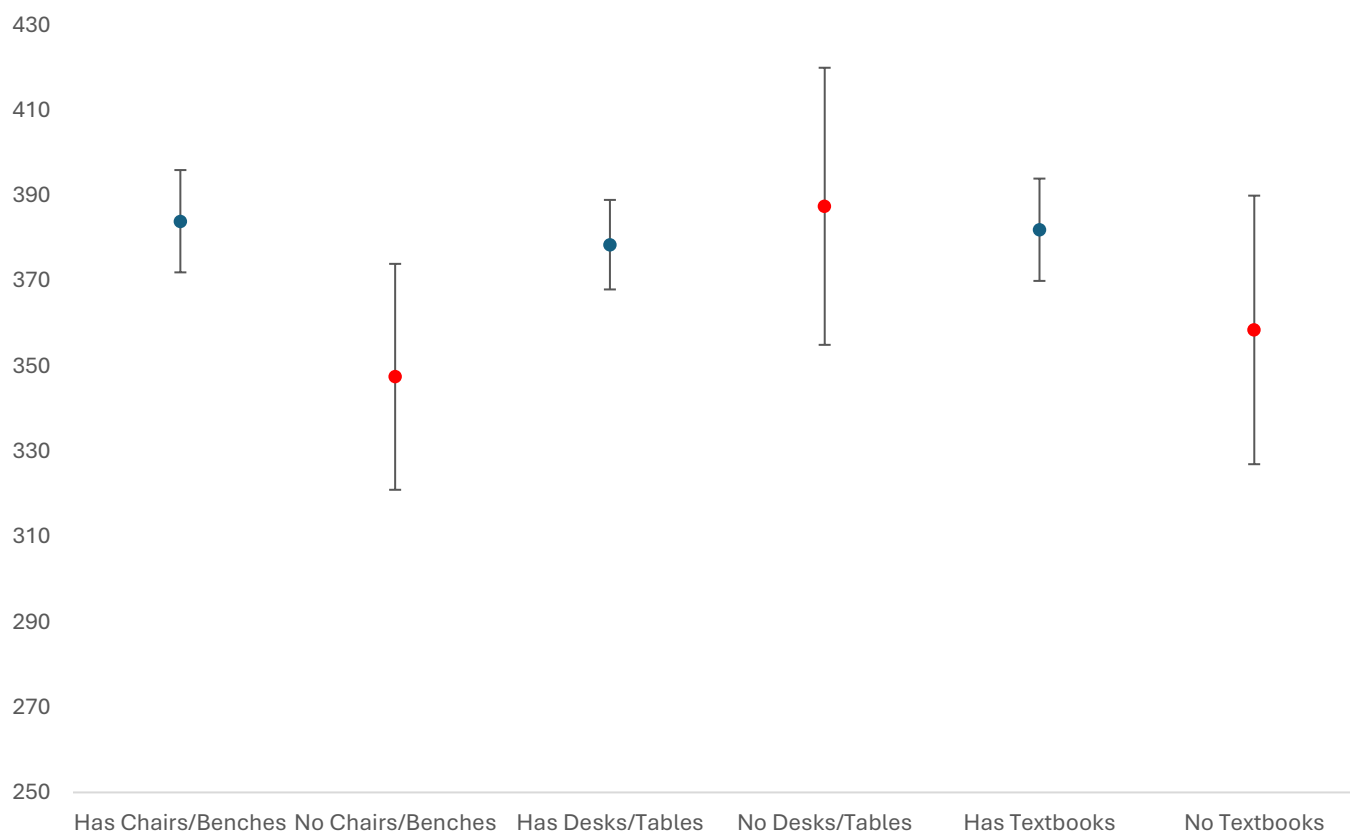


Table 19: Average Mathematics Scale Score based on Classroom Resources

Province	Chairs or Benches			Desks or Tables			Textbooks		
	% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement		% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement		% Students of schools responding "Yes"	95% Confidence Interval for Average Achievement	
		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"		Students of Schools Responding "Yes"	Students of Schools Responding "No"
AJK - Gilgit-Baltistan	88 (5.3)	347-401	317-441	64 (7.4)	347-410	330-404	91 (4.5)	349-398	254-503
Balochistan	71 (8.9)	273-324	279-489	63 (6.8)	289-334	240-449	90 (4.7)	283-371	206-379
Islamabad	96 (3.2)	411-461	306-481	95 (3.4)	412-462	318-459	93 (3.6)	415-465	308-407
KPK	81 (8.8)	307-343	288-366	75 (7.2)	302-339	301-377	91 (5.9)	305-337	264-473
Punjab	94 (2.9)	391-424	298-394	86 (5.4)	384-414	391-480	94 (2.8)	389-424	305-436
Sindh	86 (6.2)	347-376	314-394	84 (3.9)	348-380	314-375	85 (5.5)	348-378	315-375
Pakistan Average	89 (2.5)	372-396	321-374	82 (3.5)	368-389	355-420	92 (2.1)	370-394	327-390

Student Attributes

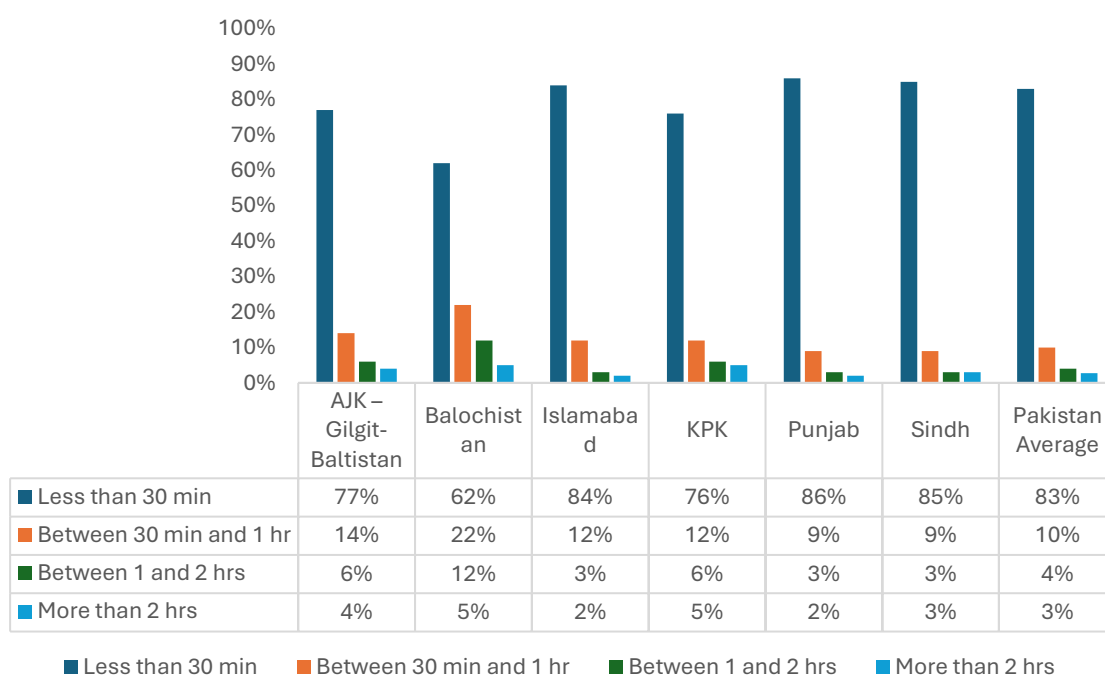
The students that participated in the LaNA exercise were also asked to complete a very simple questionnaire. This questionnaire gathered information about students' experiences in the school. In the following sections, the scores of students are disaggregated into groups to better understand how different situations affect their academic performance in Reading and Mathematics.

Distance to School

The amount of time that students spend travelling to and from school every day has the potential to affect their academic performance as it is time that they do not spend in the school or in other activities that are important for their development. Graph 20 showcases the responses obtained in this question from the students that participated in this assessment. Overall, 83 percent of students in Pakistan reported spending "30 minutes or less" to get to school, 10 percent reported "30 minutes to 1 hour", 4 percent reported "1 hour to 2 hours" and 3 percent reported taking "2 hours or more" to get to school. There are important differences between provinces with respect to the responses obtained. In provinces with higher population density like Punjab, Islamabad or Sindh had more than 84 percent of their students living "30 minutes or less" from their school whereas for sparsely populated provinces like AJK / Gilgit-Baltistan or Balochistan, the percentage of students that live less than 30 minutes away from their school goes down to less than 77 percent (Table 20 provides more detailed information on the percentage of students that selected each of the possible options).

In the reading assessment, students who live "30 minutes or less" had a 95 percent confidence interval scores that went from 324 to 349 points whereas the interval for those students who had to commute for "2 hours or more" went from 261 to 328 points. For the mathematics assessment, the students who live "30 minutes or less" from their school had a 95 percent confidence interval that goes from 375 to 397 points while those that lived the farthest, that is 2 hours or more, had a confidence interval that goes from 300 to 365.

Graph 20: Percentage of students by province and distance to school (%)



In the reading assessment, students who live “30 minutes or less” had a 95 percent confidence interval scores that went from 324 to 349 points whereas the interval for those students who had to commute for “2 hours or more” went from 261 to 328 points. For the mathematics assessment, the students who live “30 minutes or less” from their school had a 95 percent confidence interval that goes from 375 to 397 points while those that lived the farthest, that is 2 hours or more, had a confidence interval that goes from 300 to 365. Graph 21 illustrates how the 95 percent confidence intervals of reading scale scores changes based on how far the student must commute from to arrive to the school. As shown, the average point score of those students commuting for less than 1 hour to the school is higher than those that commute for more than one hour every day. The 95 confidence intervals of students commuting for less than one hour do not overlap with the intervals of the students that commute between 1 and 2 hours, implying a statistically significant difference between these two groups in the reading assessment.

Graph 21: Average Reading Scale Score based on Distance to School and province

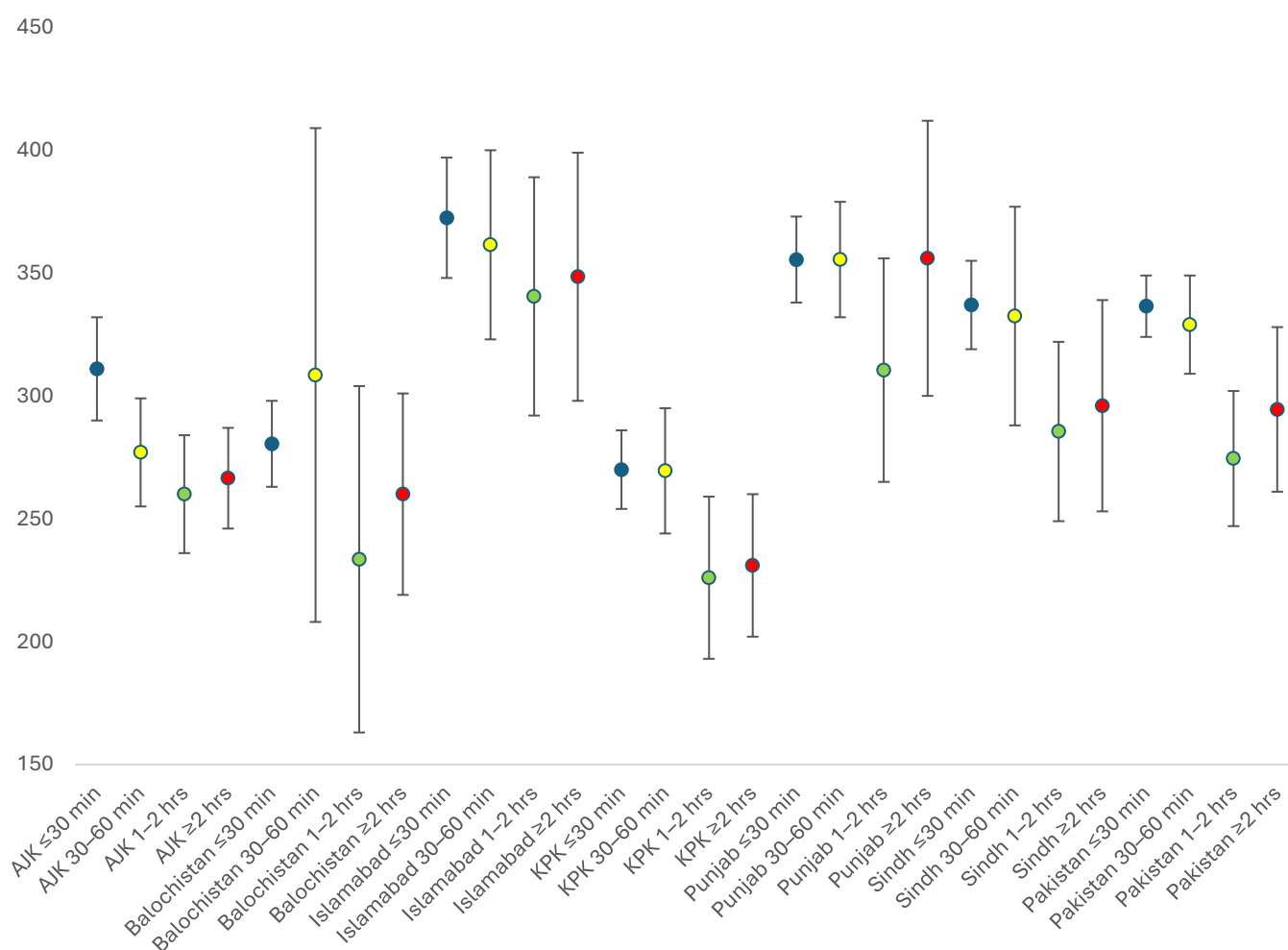


Table 20: Average Reading Scale Score based on Distance to School and province

Province	30 minutes or less		30 minutes to 1 hour		1 hour to 2 hours		2 hours or more	
	Percent of Students	Confidence Interval for Average Achievement	Percent of Students	Confidence Interval for Average Achievement	Percent of Students	Confidence Interval for Average Achievement	Percent of Students	Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	77 (2.9)	290-332	14 (2.0)	255-299	6 (1.5)	236-284	4 (0.6)	246-287
Balochistan	62 (5.1)	263-298	22 (3.9)	208-409	12 (1.9)	163-304	5 (1.2)	219-301
Islamabad	84 (2.1)	348-397	12 (1.6)	323-400	3 (0.5)	292-389	2 (0.5)	298-399
KPK	76 (3.2)	254-286	12 (1.7)	244-295	6 (1.4)	193-259	5 (1.7)	202-260
Punjab	86 (1.9)	338-373	9 (1.6)	332-379	3 (0.5)	265-356	2 (0.3)	300-412
Sindh	85 (2.5)	319-355	9 (1.9)	288-377	3 (0.7)	249-322	3 (0.9)	253-339
Pakistan Average	83 (1.4)	324-349	10 (1.1)	309-349	4 (0.4)	247-302	2.7 (0.3)	261-328

Like the graph above, Graph 22 illustrates how the 95 percent confidence intervals of mathematics scale scores changes based on how far the student must commute from to arrive to the school. At the national level, students that live less than an hour away from the school have a higher midpoint average than the students that have to commute for more than an hour. The confidence intervals of students commuting less than 30 minutes every day versus those that commute for more than an hour do not overlap, implying that there is a statistically significant difference in the mathematics scores between students that go to school less than 30 minutes away from their house and those that commute for more than one hour.

Table 21 provides further detail on this. The students who live “30 minutes or less” from their school had a 95 percent confidence interval that goes from 375 to 397 points while those that lived the farthest, that is 2 hours or more, had a confidence interval that goes from 300 to 365.

Graph 22: Average Mathematics Scale Score based on Distance to School

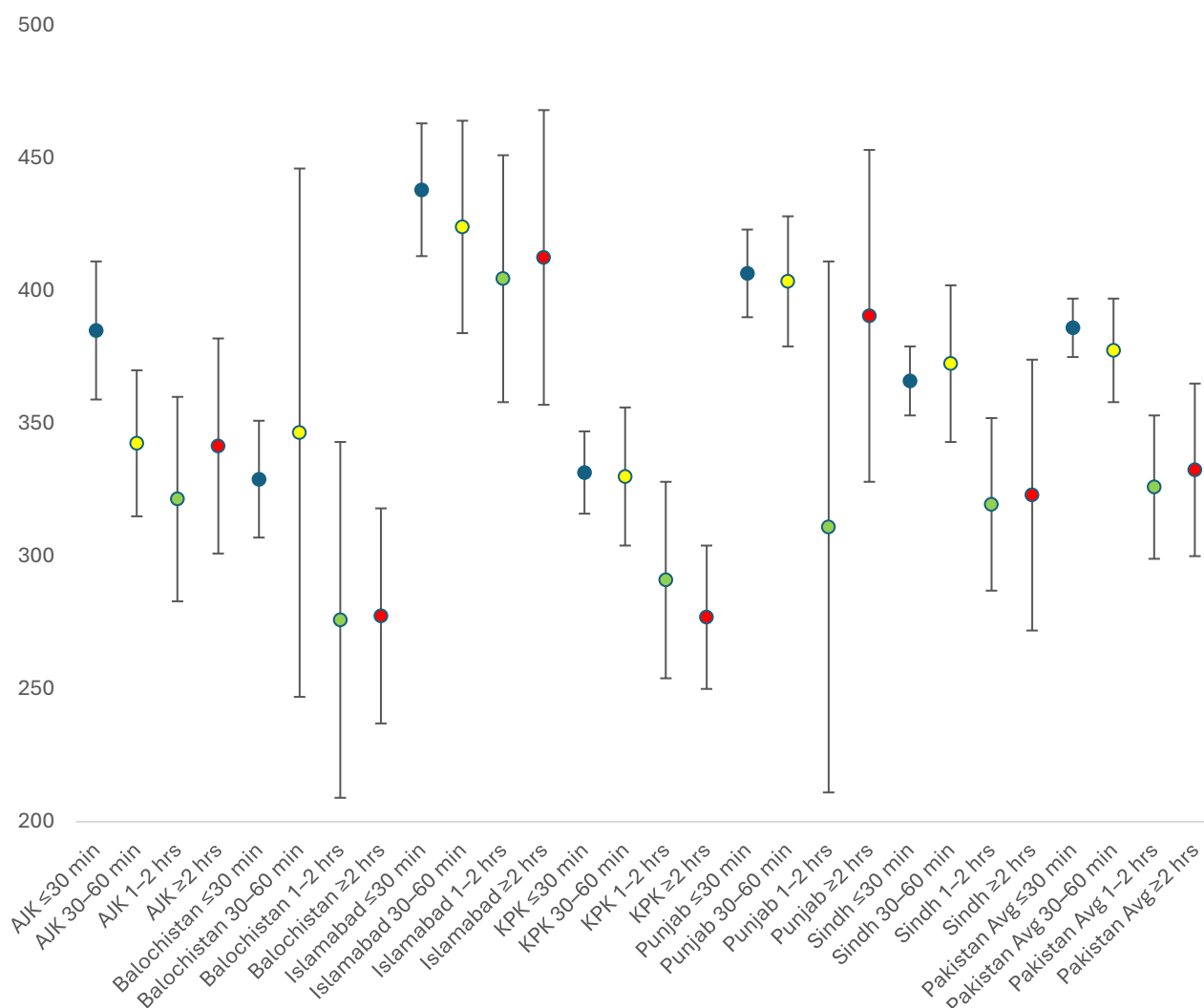


Table 21: Average Mathematics Scale Score based on Distance to School

Province	30 minutes or less		30 minutes to 1 hour		1 hour to 2 hours		2 hours or more	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	77 (2.9)	359-411	14 (2.0)	315-370	6 (1.5)	283-360	4 (0.6)	301-382
Balochistan	62 (5.1)	307-351	22 (3.9)	247-446	12 (1.9)	209-343	5 (1.2)	237-318
Islamabad	84 (2.1)	413-463	12 (1.6)	384-464	3 (0.5)	358-451	2 (0.5)	357-468
KPK	76 (3.2)	316-347	12 (1.7)	304-356	6 (1.4)	254-328	5 (1.7)	250-304
Punjab	86 (1.9)	390-423	9 (1.6)	379-428	3 (0.5)	211-411	2 (0.3)	328-453
Sindh	85 (2.5)	353-379	9 (1.9)	343-402	3 (0.7)	287-352	3 (0.9)	272-374
Pakistan Average	83 (1.4)	375-397	10 (1.1)	358-397	4 (0.4)	299-353	2.7 (0.3)	300-365

Home Resources

Following the same structure as in the school questionnaires, the student questionnaires also look at the resources that children have in their homes. Graph 23 summarises the responses of students to the questions that asked them about the availability of running water, electricity and a refrigerator in their homes. In the sample for Pakistan that was used for this exercise, we found that 96 percent of students had running water, 90 percent had electricity and 77 percent had refrigerator in their homes. The table shows that there are notable differences in

access to these resources in their homes based on the province analysed. Balochistan, Sindh and AJK/ Gilgit-Baltistan are the provinces with lowest access to these resources while Punjab and Islamabad are the ones with highest access.

Graph 23: Student Access to Household Resources by Province (%)

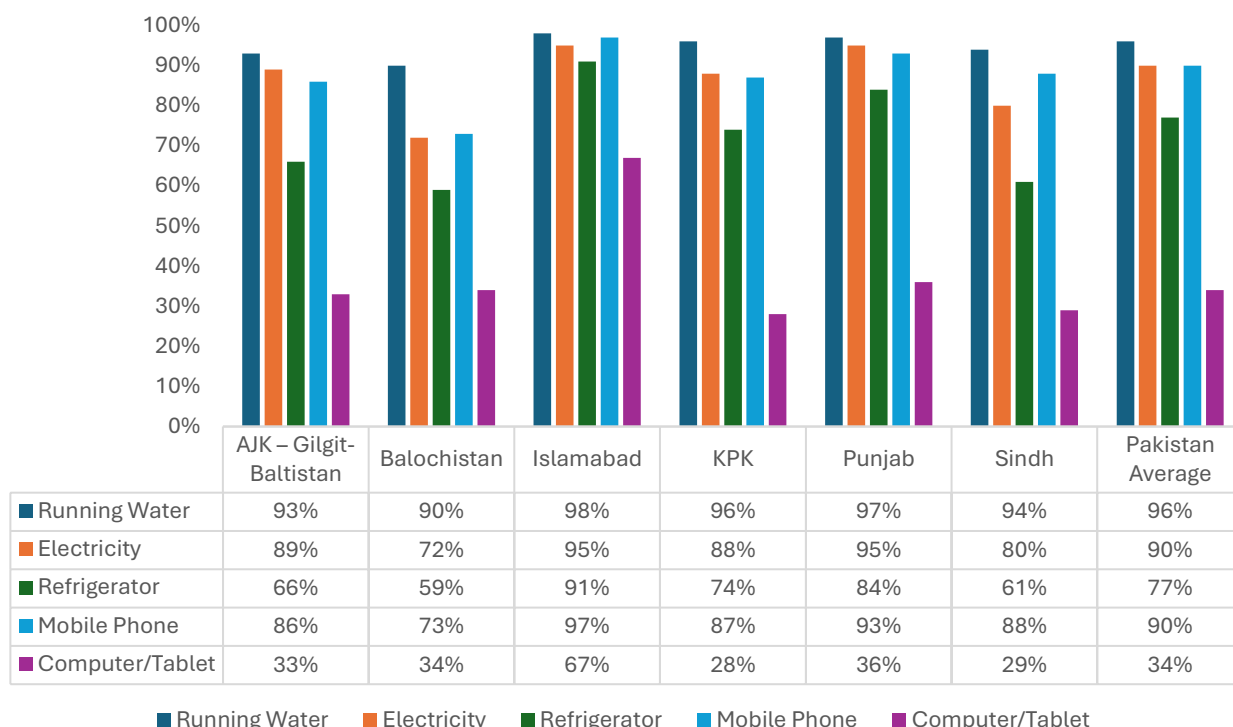


Table 22 displays the scores of children in Reading based on whether they had these resources available at home. For running water, the 95 percent confidence interval of scores of children who had access to it was 321 to 347 while the interval was 276 to 318 for those that did not have access, which shows that having running water at home is potentially responsible for some of the variation of children's scores in Pakistan. For electricity, the 95 percent confidence interval for students who had this amenity at home goes from 324 to 350 while it is 267 to 311 for those students that did not have electricity in their homes. This shows that, on average, those students who do not have electricity in their homes had a poorer school performance than those students who had access to it. For availability of a refrigerator at home, the students who had access to it had a 95 percent confidence interval that went from 322 to 350 while those that did not have access to it had a confidence interval that went from 303 to 335. Graph 24 illustrates these confidence intervals, and it can be seen how there is no overlap between the groups that have water at home and those that do not have water at home, which means that there is a statistically significant difference between these groups. The same applies when we compare students that have electricity at home versus the ones that do not have electricity. For the refrigerator variable, however, the confidence intervals overlap which implies that there are no statistically significant differences between these groups.

Graph 24: Average Reading Scale Score based on resources available at home

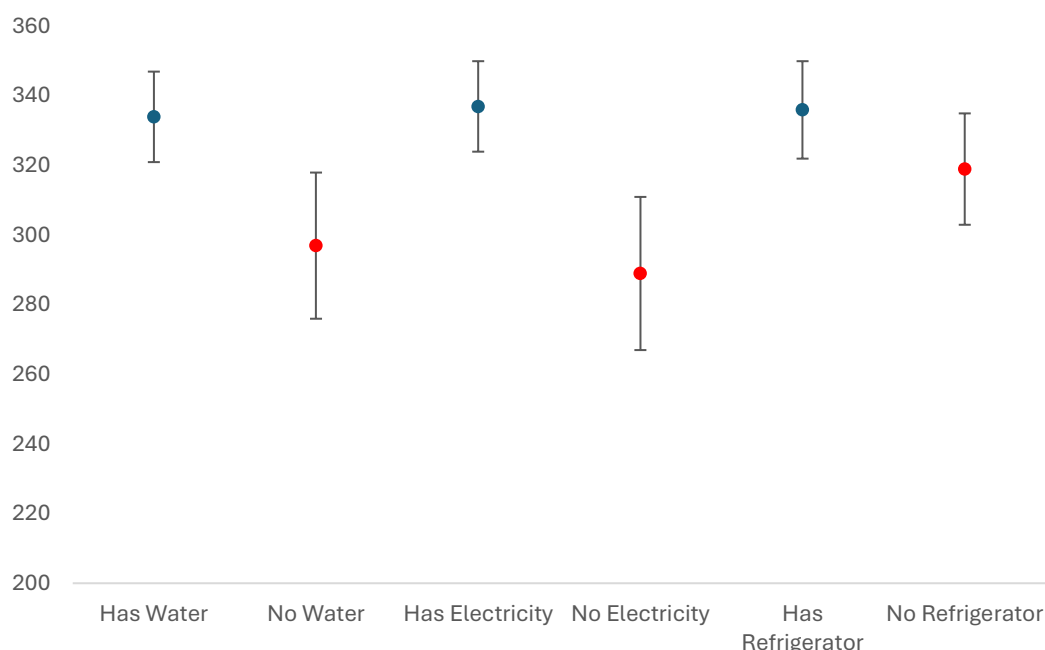


Table 22: Average Reading Scale Score based on resources available at home

Province	Running Water			Electricity			Refrigerator		
	% Students responding "Yes"	95% Confidence Interval for Students Responding "Yes"	Students Responding "No"	% Students responding "Yes"	95% Confidence Interval for Students Responding "Yes"	Students Responding "No"	% Students responding "Yes"	95% Confidence Interval for Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	93 (1.7)	284-324	247-308	89 (1.7)	285-326	241-310	66 (5.0)	288-334	264-308
Balochistan	90 (2.3)	245-325	201-286	72 (7.3)	253-289	183-427	59 (6.7)	257-290	205-374
Islamabad	98 (0.5)	346-396	259-343	95 (1.0)	348-398	271-337	91 (1.5)	349-400	295-343
KPK	96 (0.9)	251-283	178-265	88 (2.3)	255-288	201-247	74 (4.3)	261-293	220-253
Punjab	97 (0.5)	336-373	318-380	95 (0.8)	338-375	277-348	84 (1.7)	334-374	334-378
Sindh	94 (1.8)	317-354	258-340	80 (4.5)	323-359	278-319	61 (3.6)	315-354	306-356
Pakistan Average	96 (0.5)	321-347	276-318	90 (0.9)	324-350	267-311	77 (1.5)	322-350	303-335

For Mathematics, Table 23 shows the scores of students in this subject based on the availability of running water, electricity or refrigerator in their homes. For running water, the 95 percent confidence interval of student scores goes from 371 to 394 for those students that had it in their homes while it is 275 to 318 for those students that do not have running water in their homes. Similarly, the 95 percent confidence interval for those students that have electricity goes from 74 to 396 while for those that do not have electricity goes from 313 to 360. For refrigerator, the 95 percent interval of students that have it in their homes goes from 372 to 397 while this interval goes from 355 to 387 for those that do not have it in their homes. Graph 25 illustrates these relationships at the national level. The confidence intervals of those that have and don't have access to water at home overlap, which implies that there is not a statistically significant difference between these two groups. A similar pattern is seen for households with a refrigerator and those without one. On the other hand, students from households with electricity have a statistically significant difference in mathematics scores as compared to those that do not have electricity at home.

Graph 25: Average Mathematics Scale Score based on resources available at home

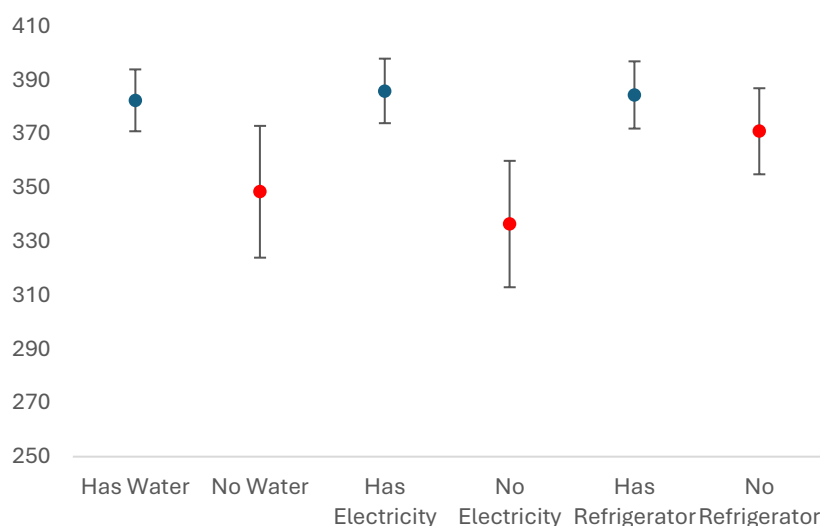


Table 23: Average Mathematics Scale Score based on resources available at home

Province	Running Water			Electricity			Refrigerator		
	% Students responding "Yes"	95% Confidence Interval for Average Achievement		% Students responding "Yes"	95% Confidence Interval for Average Achievement		% Students responding "Yes"	95% Confidence Interval for Average Achievement	
		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	93 (1.7)	350-401	316-410	89 (1.7)	351-403	300-415	66 (5.0)	350-406	339-400
Balochistan	90 (2.3)	286-370	258-335	72 (7.3)	294-339	222-466	59 (6.7)	296-335	251-421
Islamabad	98 (0.5)	412-461	325-412	95 (1.0)	413-463	326-412	91 (1.5)	414-464	366-421
KPK	96 (0.9)	314-344	222-323	88 (2.3)	317-349	251-305	74 (4.3)	315-352	286-330
Punjab	97 (0.5)	387-422	360-433	95 (0.8)	390-424	328-402	84 (1.7)	385-421	388-435
Sindh	94 (1.8)	350-378	308-390	80 (4.5)	355-383	313-364	61 (3.6)	349-381	341-380
Pakistan Average	96 (0.5)	371-394	324-373	90 (0.9)	374-398	313-360	77 (1.5)	372-397	355-387

Digital Resources

The questionnaire also contained questions about digital resources that students have in their homes, especially mobile phones, computers and tablets. From the sample of students taken for this assessment, 90 percent reported having a mobile phone at home while only 34 percent reported having a computer or a tablet at home.

Table 18 shows the scores of students on the reading exercise based on the availability of digital resources in their homes. The students that reported having a mobile phone at home had a 95 percent confidence interval of their scores goes from 323 to 349 while the interval for those that did not have a mobile phone goes from 278 to 324. In the case of the question that asks whether they have computer or tablets at home, those that had one of these devices have a 95 percent confidence interval of their scores that goes from 320 to 354 while those that did not have any of these devices have a confidence interval that goes from 318 to 343 score points. Graph 26 illustrates these relationships and shows how the confidence intervals do intersect, which implies that there is not a statistically significant difference in reading scores of students that have access to digital resources at home versus those that do not have access to these resources.

Graph 26: Average Reading Scale Score by Student Hunger Frequency at School

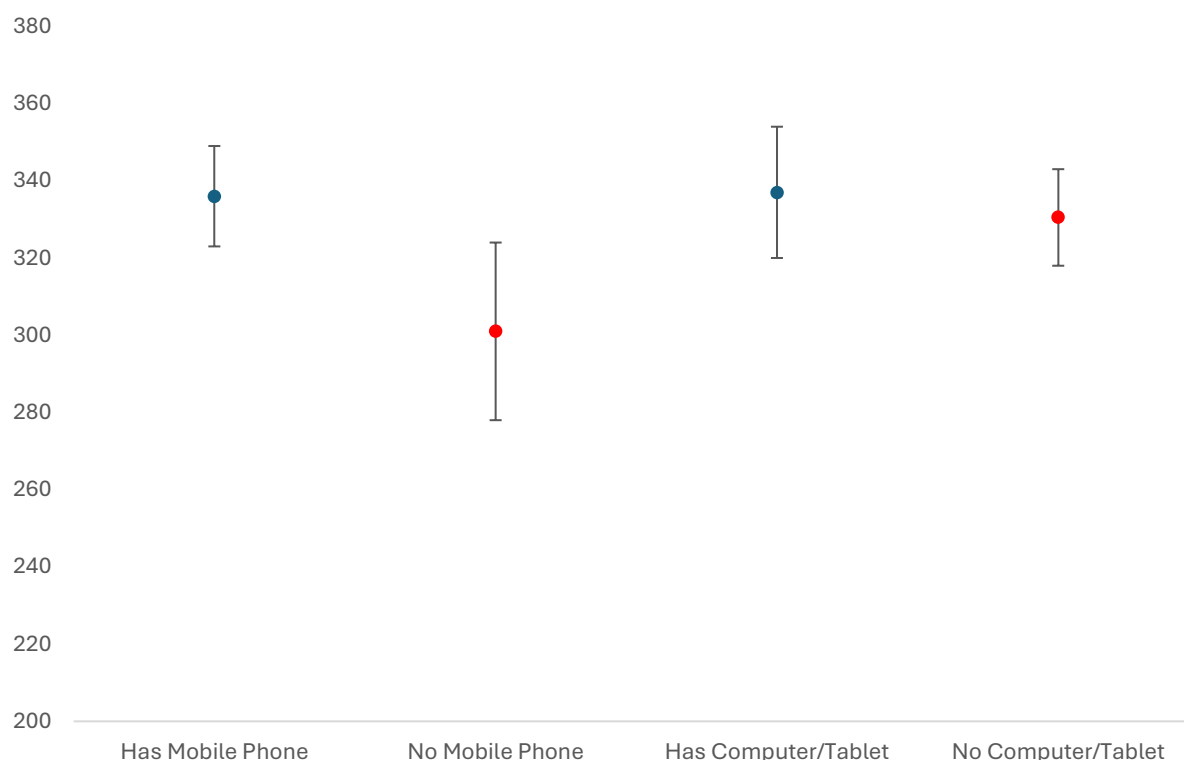


Table 24: Average Reading Scale Score based on digital resources available at home

Province	Mobile Phone			Computer or Tablet		
	% Students responding "Yes"	95% Confidence Interval for		% Students responding "Yes"	95% Confidence Interval for	
		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	86 (2.7)	286-329	247-294	33 (3.9)	276-338	282-318
Balochistan	73 (4.3)	257-304	202-367	34 (4.1)	234-277	244-344
Islamabad	97 (0.6)	347-396	265-347	67 (2.8)	361-414	310-355
KPK	87 (1.9)	253-287	217-253	28 (2.1)	257-299	243-280
Punjab	93 (1.1)	338-375	294-370	36 (2.8)	332-379	336-371
Sindh	88 (2.5)	317-354	286-350	29 (3.7)	308-350	315-356
Pakistan Average	90 (0.9)	323-349	278-324	34 (1.9)	320-354	318-343

For the Mathematics subject, those students that have a mobile phone at home have a 95 percent confidence interval that goes from 374 to 397 while those that do not have a mobile home have an interval that goes from 321 to 366. In the question about whether they have access to a computer or a tablet have a 95 percent confidence interval that goes from 369 to 405 score points while those that do not have access to any of these devices goes from 368 to 390 score points. Graph 27 illustrates these relationships. The difference in scores between students with mobile phones at home and those that do not have access to a device is statistically significant at the 95 percent confidence level. On the other hand, as seen in this graph, the difference in mathematics scores between students with computers/tablets at home and those that do not have these resources is not statistically significant at the 95 percent level.

Graph 27: Average Mathematics Scale Score based on digital resources available at home

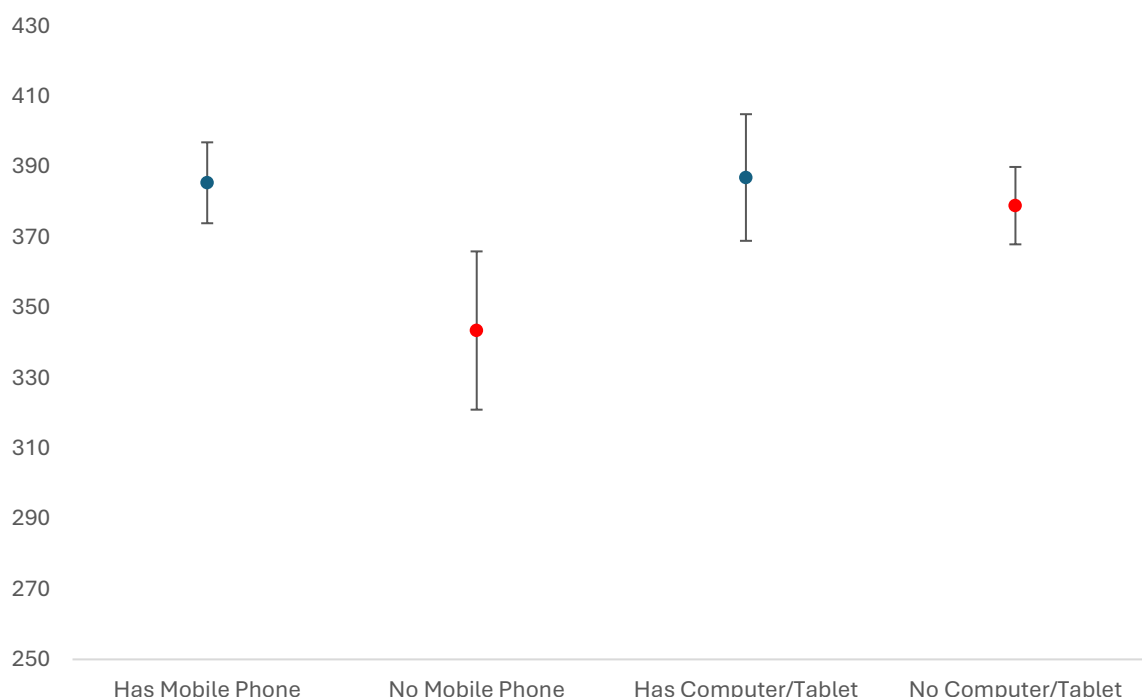


Table 25: Average Mathematics Scale Score based on digital resources available at home

Province	Mobile Phone			Computer or Tablet		
	% Students responding "Yes"	95% Confidence Interval for Average Achievement		% Students responding "Yes"	95% Confidence Interval for Average Achievement	
		Students Responding "Yes"	Students Responding "No"		Students Responding "Yes"	Students Responding "No"
AJK - Gilgit-Baltistan	86 (2.7)	354-407	308-373	33 (3.9)	334-408	352-400
Balochistan	73 (4.3)	298-351	244-410	34 (4.1)	268-323	290-392
Islamabad	97 (0.6)	412-462	322-425	67 (2.8)	427-479	375-422
KPK	87 (1.9)	315-348	272-308	28 (2.1)	308-357	308-340
Punjab	93 (1.1)	390-424	335-412	36 (2.8)	382-432	387-419
Sindh	88 (2.5)	352-380	309-374	29 (3.7)	349-387	346-377
Pakistan Average	90 (0.9)	374-397	321-366	34 (1.9)	369-405	368-390

Arriving at School Feeling Hungry

In developing countries, students's nutrition is a key issue hindering their academic performance. In the student questionnaires, children were asked about how often they feel hungry. Graph 28 illustrates the responses of the students that participated in this assessment. In Pakistan, 44 percent of the children that took place in this study responded that they feel hungry "every day", 9 percent responded "almost every day", 28 percent reported that they "sometimes" feel hungry, and 19 percent said that they "never" feel hungry.

With regards to the provincial differences, we see that those that Balochistan has the highest percentage of children that report feeling hungry "every day" with 33 percent while Punjab has the lowest level with 12 percent.

The 95 percent confidence interval of the reading scores of students that feel hungry every day goes from 321 to 350 while this interval goes from 333 to 372 for those students that never feel hungry when arriving to school. For Mathematics, the 95 percent of the scores for those students that feel hungry every day when arriving to school goes from 366 to 394 while for those that never feel hungry goes from 379 to 422.

Graph 28: Percentage of students arriving at school feeling hungry (%)

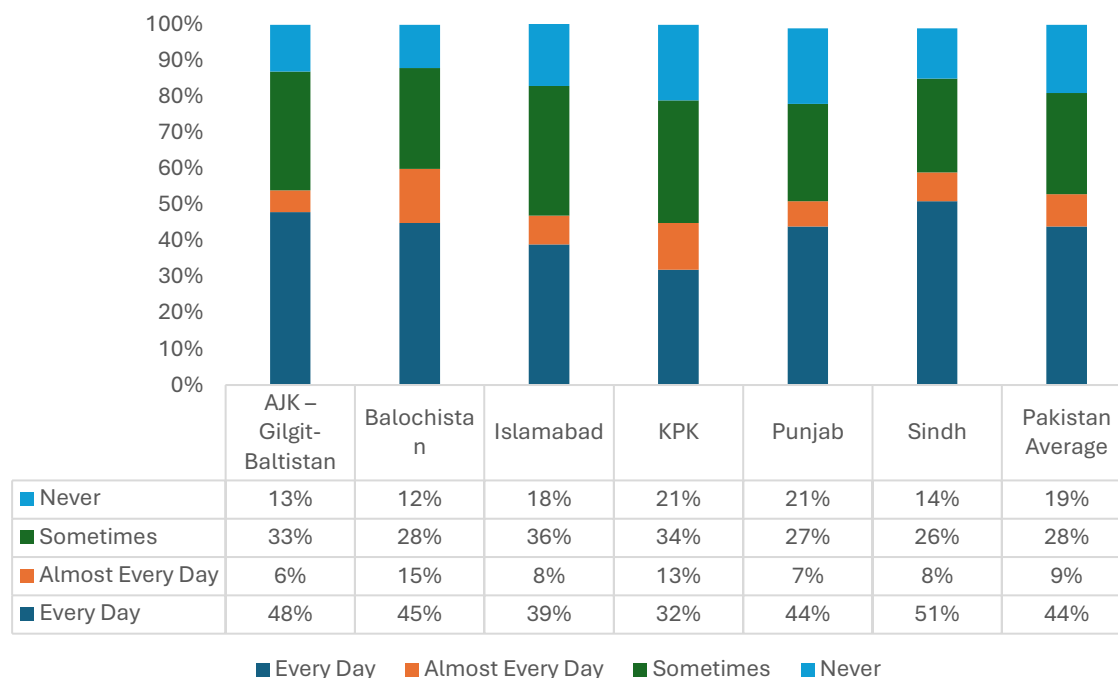


Table 26 provides insights on the confidence intervals of the reading scores of students by province based on how they responded this question. The 95 percent confidence interval of the reading scores of students that feel hungry every day goes from 321 to 350 while this interval goes from 333 to 372 for those students that never feel hungry when arriving to school. As illustrated in Graph 29, the confidence intervals of reading scores overlap with each other for all the provinces analysed. This implies that there are no statistically significant differences between the scores of students in the reading assessment between those that arrive to school feeling hungry every day and those that never feel hungry.

Graph 29: Average Reading Scale Score by Student Hunger Frequency

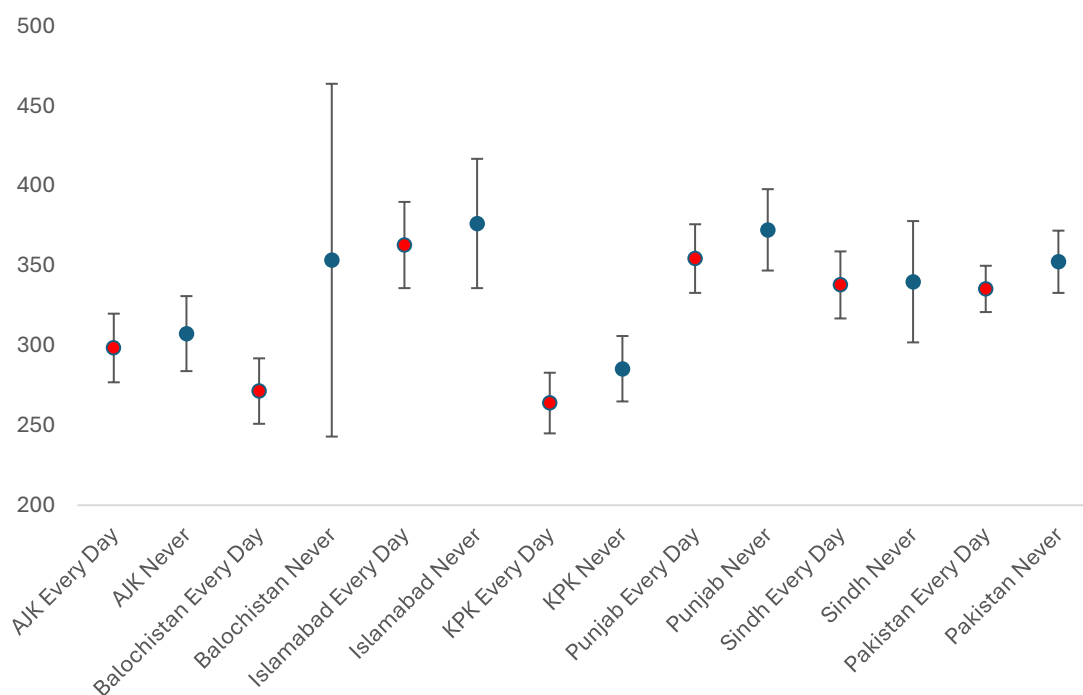


Table 26: Average Reading Scale Score based on how often the student feels hungry when arriving to school

Province	Every day		Almost every day		Sometimes		Never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	48 (4.1)	277-320	6 (1.0)	222-313	33 (3.4)	297-349	13 (2.0)	284-331
Balochistan	45 (5.7)	251-292	15 (1.9)	198-321	28 (4.5)	249-331	12 (2.9)	243-464
Islamabad	39 (4.4)	336-390	8 (0.9)	354-421	36 (2.8)	348-400	18 (3.0)	336-417
KPK	32 (4.2)	245-283	13 (2.5)	220-263	34 (3.4)	251-292	21 (3.4)	265-306
Punjab	44 (2.9)	333-376	7 (1.3)	314-354	27 (2.2)	329-373	21 (2.7)	347-398
Sindh	51 (4.3)	317-359	8 (1.7)	270-338	26 (3.0)	314-357	14 (2.3)	302-378
Pakistan Average	44 (2.0)	321-350	9 (0.9)	285-318	28 (1.6)	316-345	19 (1.8)	333-372

Table 27 showcases the confidence intervals of mathematics scores of students based on their response to the question about how often they feel hungry when arriving to school. The 95 percent of the scores for those students that feel hungry every day when arriving to school goes from 366 to 394 while for those that never feel hungry goes from 379 to 422. As shown in Graph 30, the confidence intervals of those students that respond that they never feel hungry when arriving to school versus those that stated that they always feel hungry overlap. This implies that there is not a statistically significant difference between the children that report feeling hungry every day when arriving to school and those that never feel hungry.

Graph 30: Average Mathematics Scale Score by Student Hunger Frequency

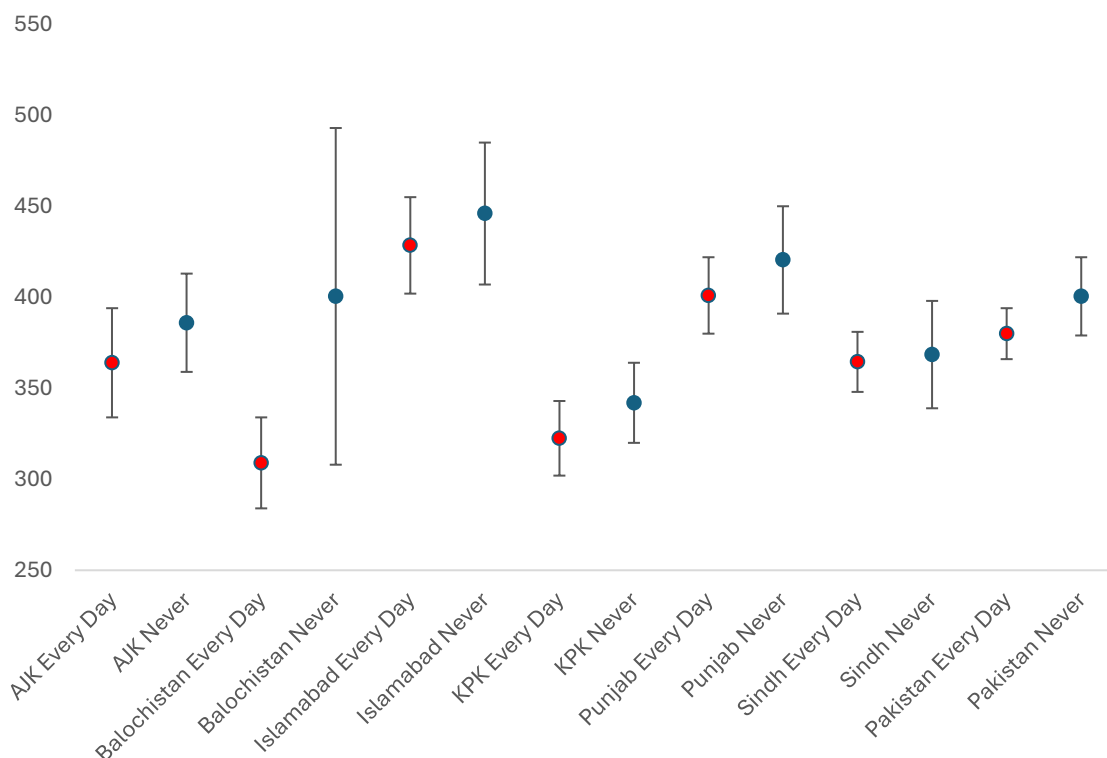


Table 27: Average Mathematics Scale Score by Student Hunger Frequency at School

Province	Every day		Almost every day		Sometimes		Never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	48 (4.1)	334-394	6 (1.0)	279-381	33 (3.4)	374-432	13 (2.0)	359-413
Balochistan	45 (5.7)	284-334	15 (1.9)	240-372	28 (4.5)	304-384	12 (2.9)	308-493
Islamabad	39 (4.4)	402-455	8 (0.9)	408-488	36 (2.8)	413-461	18 (3.0)	407-485
KPK	32 (4.2)	302-343	13 (2.5)	277-320	34 (3.4)	319-365	21 (3.4)	320-364
Punjab	44 (2.9)	380-422	7 (1.3)	378-427	27 (2.2)	388-424	21 (2.7)	391-450
Sindh	51 (4.3)	348-381	8 (1.7)	302-373	26 (3.0)	354-390	14 (2.3)	339-398
Pakistan Average	44 (2.0)	366-394	9 (0.9)	340-381	28 (1.6)	374-399	19 (1.8)	379-422

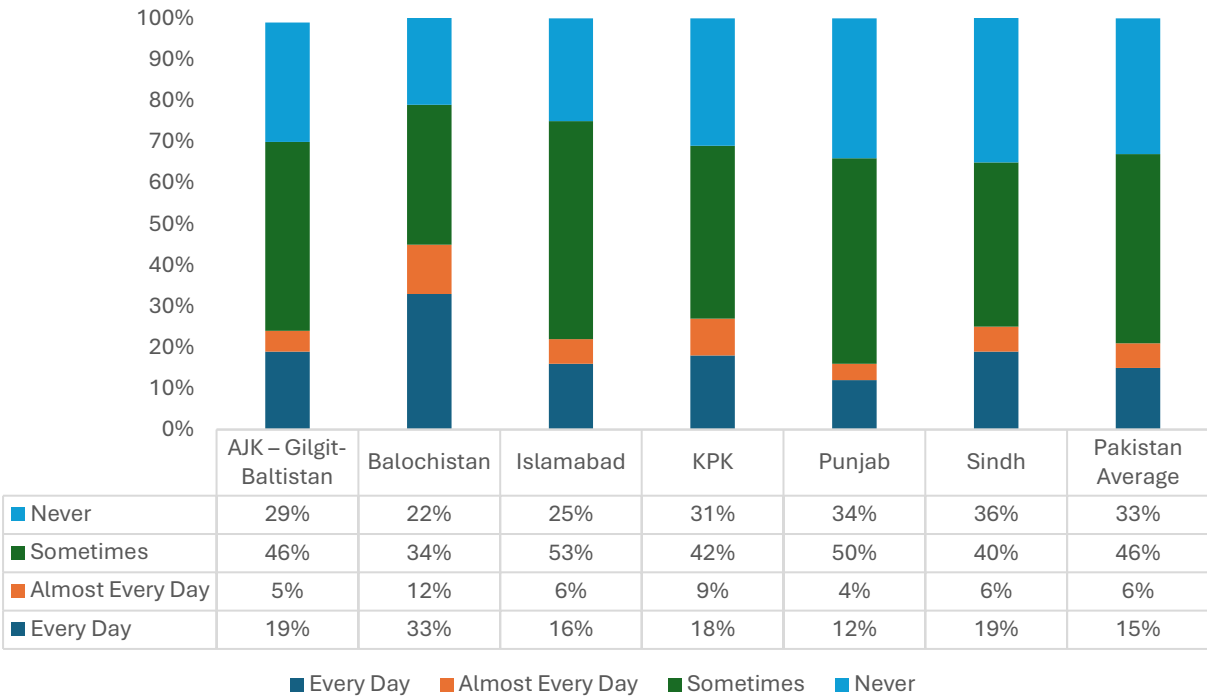
Arriving at School Feeling Tired

The questionnaire also captured the self-perception of children about whether they feel tired when they arrive to school. Overall, 15 percent of children reported feeling tired “every day”, 6 percent “almost every day”, 46 percent “sometimes” and 33 percent “never”. This metric aims at capturing how factors such as nutrition or work that the child is involved in after school impact the student’s abilities to perform in Reading and Mathematics. In this metric, we see that Bolochistan has the highest number of children that report being tired “every day” while Punjab is the one that has the lowest value in this domain.

In the reading assessment, the 95 percent confidence interval of the scores of children that felt tired “every day” went from 293 to 330. This interval goes from 324 to 354 for the students that “never” feel tired when arriving to school.

In the mathematics assessment, the 95 percent confidence interval of scores of children that reported feeling tired “every day” when arriving to school goes from 335 to 373 while the interval for those that reported “never” feeling tired goes from 372 to 403.

Graph 31: Percentage of students arriving at school feeling tired (%)



Graph 32: Average Reading Scale Score by Student Tiredness Frequency

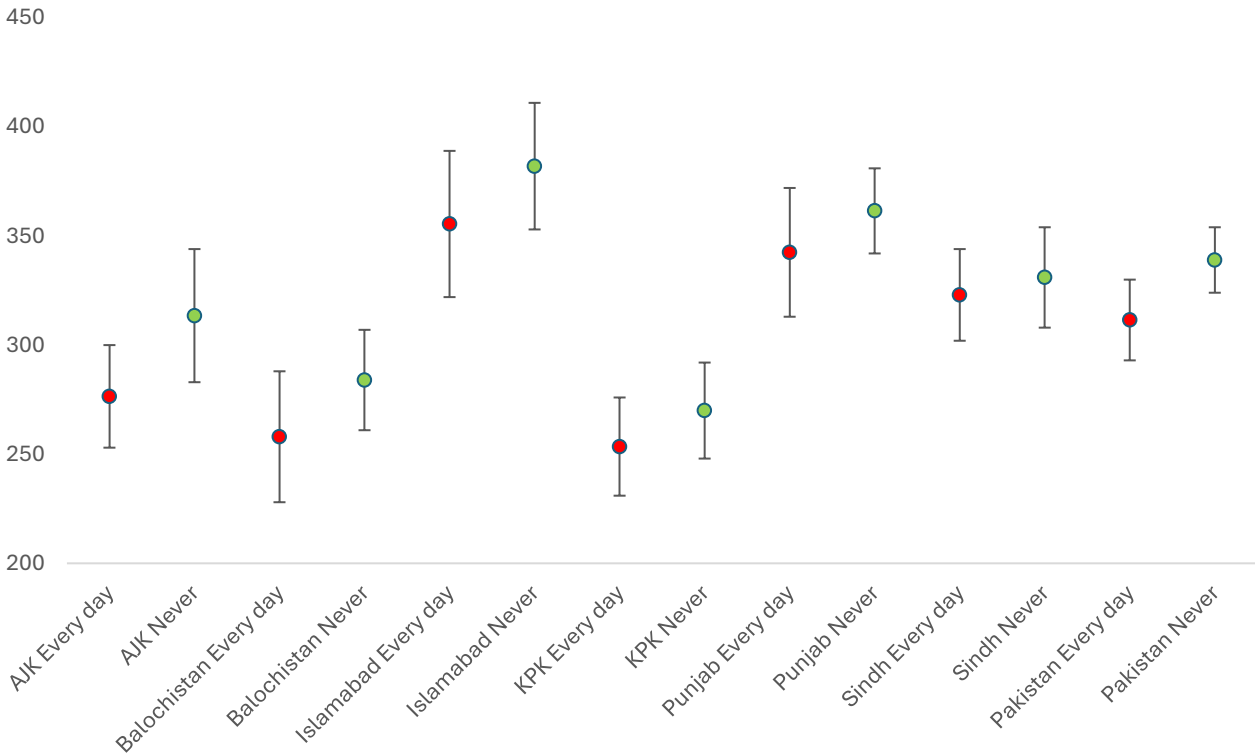


Table 28: Average Reading Scale Score by Student Tiredness Frequency at School

Province	Every day		Almost every day		Sometimes		Never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	19 (2.2)	253-300	5 (0.9)	254-323	46 (3.1)	288-326	29 (3.2)	283-344
Balochistan	33 (5.9)	228-288	12 (1.6)	171-301	34 (3.6)	266-375	22 (4.3)	261-307
Islamabad	16 (1.4)	322-389	6 (1.3)	350-464	53 (3.3)	342-388	25 (3.5)	353-411
KPK	18 (2.8)	231-276	9 (1.6)	216-276	42 (3.5)	255-293	31 (4.0)	248-292
Punjab	12 (1.7)	313-372	4 (1.1)	298-367	50 (2.8)	332-376	34 (2.9)	342-381
Sindh	19 (3.9)	302-344	6 (1.7)	284-380	40 (5.9)	320-363	36 (7.9)	308-354
Pakistan Average	15 (1.3)	293-330	6 (0.8)	278-326	46 (2.0)	322-354	33 (2.3)	324-354

Table 29: Average Mathematics Scale Score by Student Tiredness Frequency at School

Province	Every day		Almost every day		Sometimes		Never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	19 (2.2)	308-370	5 (0.9)	307-399	46 (3.1)	357-404	29 (3.2)	352-428
Balochistan	33 (5.9)	263-325	12 (1.6)	220-346	34 (3.6)	314-422	22 (4.3)	304-363
Islamabad	16 (1.4)	383-446	6 (1.3)	414-533	53 (3.3)	408-453	25 (3.5)	421-479
KPK	18 (2.8)	279-333	9 (1.6)	288-361	42 (3.5)	321-355	31 (4.0)	306-351
Punjab	12 (1.7)	353-414	4 (1.1)	359-455	50 (2.8)	388-423	34 (2.9)	388-432
Sindh	19 (3.9)	335-377	6 (1.7)	327-413	40 (5.9)	350-386	36 (7.9)	345-381
Pakistan Average								

Student's Sense of School Safety

Children need to feel safe in the school to unveil their full academic potential. In the question that asks students their opinion about whether they feel safe in their school, 84 percent of students that participated in the assessment “agree a lot”, 12 percent “agree a little”, 2 percent “disagree a little” and 2 percent “disagree a lot”. Out of all the provinces studied, the ones that had the highest level of students “disagreeing a lot” to the statement are AJK-Gilgit Baltistan and Balochistan while the ones with highest percentages of students “agreeing a lot” to the statement are Punjab and Sindh.

Graph 33: Percentage of students feeling safe at school (%)

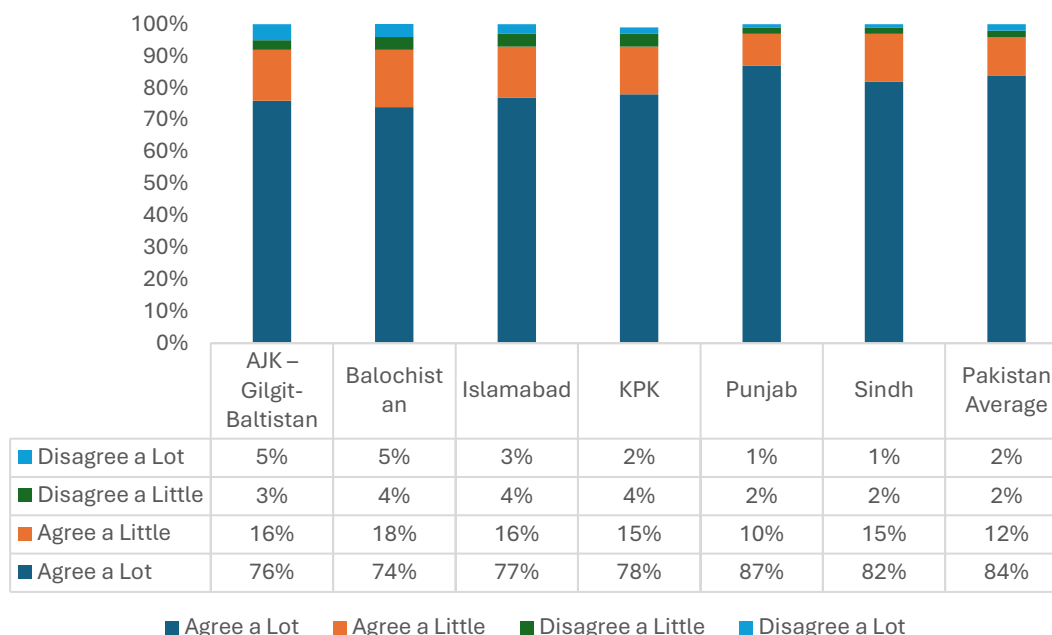


Table 30 provides information on the reading scores of students based on how they perceive their school safety. The 95 percent confidence interval of the reading scores of students that “agree a lot” to the statement about whether they feel safe in their school goes from 327 to 353. For students that “disagree a lot” to this statement, their 95 percent confidence interval of reading scores goes from 283 to 318. The lack of overlapping between these two intervals implies that there is a statistically significant difference between the reading scores of these two groups. At the national level, the confidence intervals of the groups that sit at the extremes of scale do not overlap which implies that the difference in average point scores between these groups is statistically significant. At the provincial level, however, this overlap disappears and therefore the relationship between these two same groups is not statistically significant.

Graph 34: Average Reading Scale Score based on student’s sense of school safety

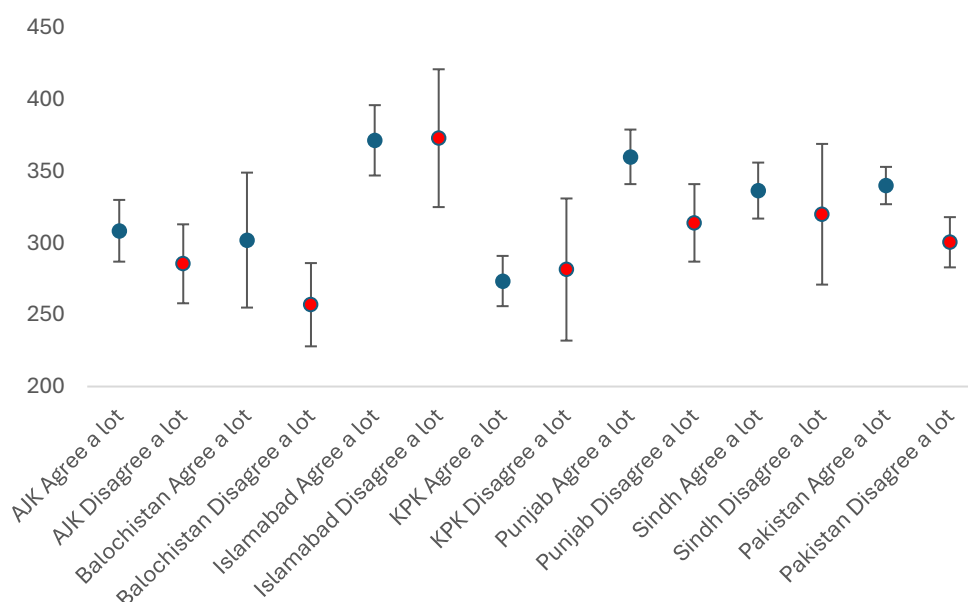


Table 30: Average Reading Scale Score based on student's sense of school safety

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	76 (2.5)	287-330	16 (2.2)	264-318	3 (0.7)	244-316	5 (1.2)	258-313
Balochistan	74 (3.0)	255-349	18 (2.3)	221-266	4 (1.2)	137-297	5 (0.9)	228-286
Islamabad	77 (2.3)	347-396	16 (2.0)	336-400	4 (0.4)	351-429	3 (0.8)	325-421
KPK	78 (3.3)	256-291	15 (2.7)	226-279	4 (1.1)	179-246	2 (0.7)	232-331
Punjab	87 (1.4)	341-379	10 (1.3)	311-362	2 (0.5)	282-376	1 (0.4)	287-341
Sindh	82 (2.7)	317-356	15 (2.4)	304-357	2 (0.6)	260-352	1 (0.4)	271-369
Pakistan Average	84 (1.1)	327-353	12 (1.0)	295-328	2 (0.4)	245-318	2 (0.3)	283-318

Table 31 In the mathematics examination, the students that “agree a lot” to the statement of whether they feel safe in their schools had a 95 percent confidence interval of their scores that went from 377 to 401. On the other hand, the students that “disagree a lot” to the statement had a 95 percent confidence interval of their mathematic scores that went from 331 to 372. Like what was observed with the reading scores, there is no overlap in the confidence intervals between these groups, suggesting that there is a statistically significant difference between the mathematics scores of these groups of students at the national level.

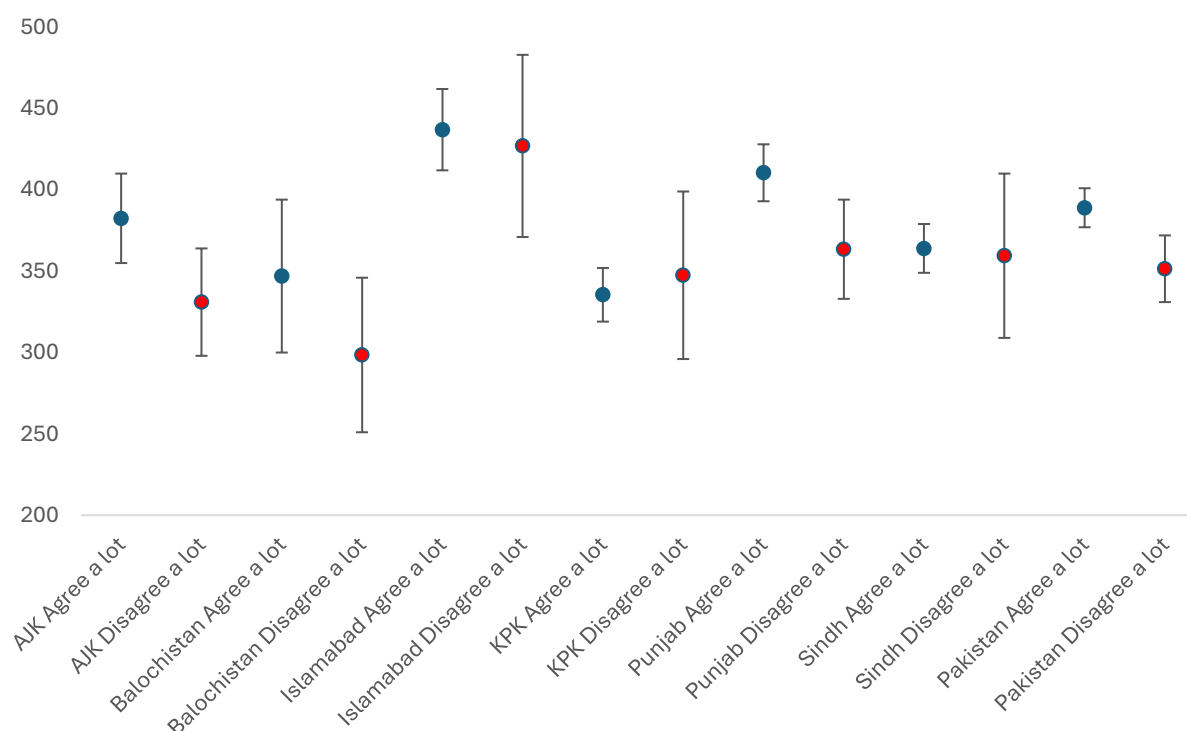
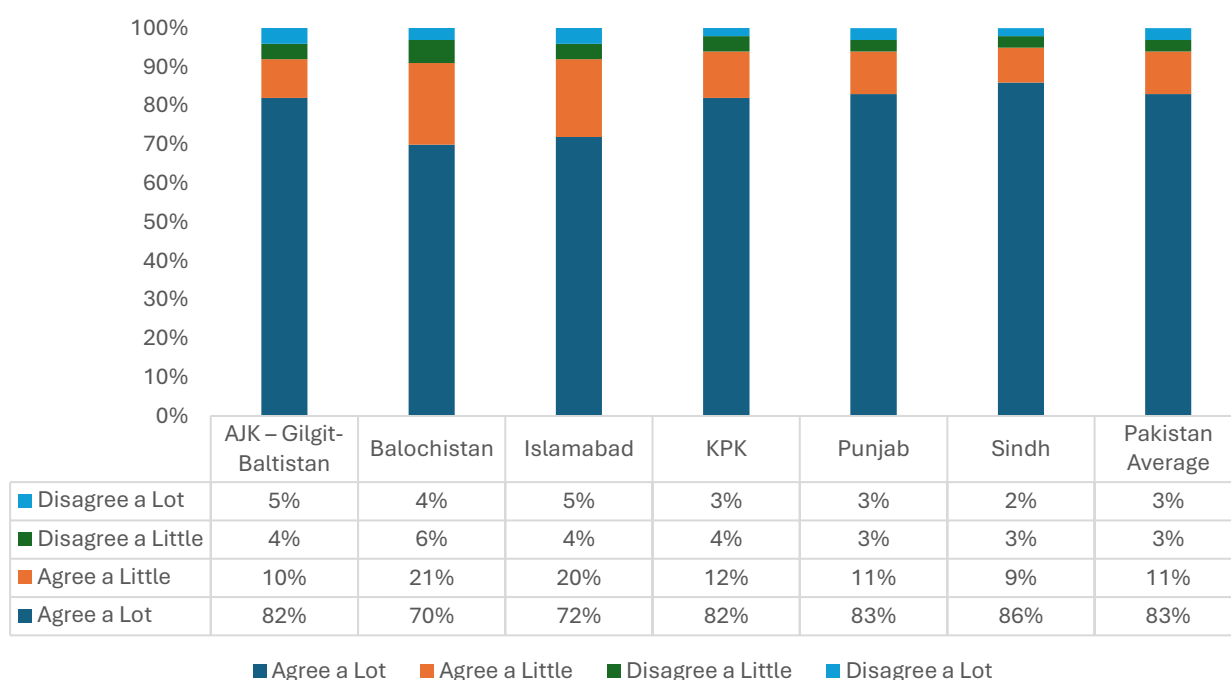
Graph 35: Average Mathematics Scale Score based on student's sense of school safety

Table 31: Average Mathematics Scale Score based on student's sense of school safety

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	76 (2.5)	355-410	16 (2.2)	328-394	3 (0.7)	319-407	5 (1.2)	298-364
Balochistan	74 (3.0)	300-394	18 (2.3)	262-310	4 (1.2)	192-350	5 (0.9)	251-346
Islamabad	77 (2.3)	412-462	16 (2.0)	408-471	4 (0.4)	389-482	3 (0.8)	371-483
KPK	78 (3.3)	319-352	15 (2.7)	285-336	4 (1.1)	244-311	2 (0.7)	296-399
Punjab	87 (1.4)	393-428	10 (1.3)	370-417	2 (0.5)	335-398	1 (0.4)	333-394
Sindh	82 (2.7)	349-379	15 (2.4)	360-392	2 (0.6)	277-394	1 (0.4)	309-410
Pakistan Average	84 (1.1)	377-401	12 (1.0)	351-382	2 (0.4)	303-357	2 (0.3)	331-372

Student's Sense of School Belonging

Graph 36 looks at how students that participated in the LaNA exercise about whether they feel like they belong to their school. In the sample, it was found that 83 percent of the students “agree a lot” to the question about whether they feel like they belong to the school, 11 percent “agree a little”, 3 percent “disagree a little” and 3 percent “disagree a lot”. Thus, the vast majority of the students in Pakistan have shown that they have a strong sense of belonging to the school they go to. There are, however, notable differences between provinces, with Punjab and Sindh showing the highest percentage of students that feel like they belong to school and Balochistan and Islamabad with the lowest percentage in this measure.

Graph 36: Percentage of students feeling that they belong to their school (%)

There are important differences in the scores of students in the reading based on their attitudes towards reading as shown in detail in Table 32. Those students reporting “agreeing a lot” to the question about whether they enjoy reading have a 95 percent confidence interval of their scores that goes from 325 to 350. On the other side, the scores of those students that “disagree a lot” with the statement about whether they enjoy reading goes from 282 to 337. Graph 37 illustrates these confidence intervals for all the groups. As show, these confidence

intervals overlap both at the national level as well as for every province and therefore we fail to find a statistically significant difference in reading scores between these two groups.

Graph 37: Average Reading Scale Score based on student's sense of school belonging

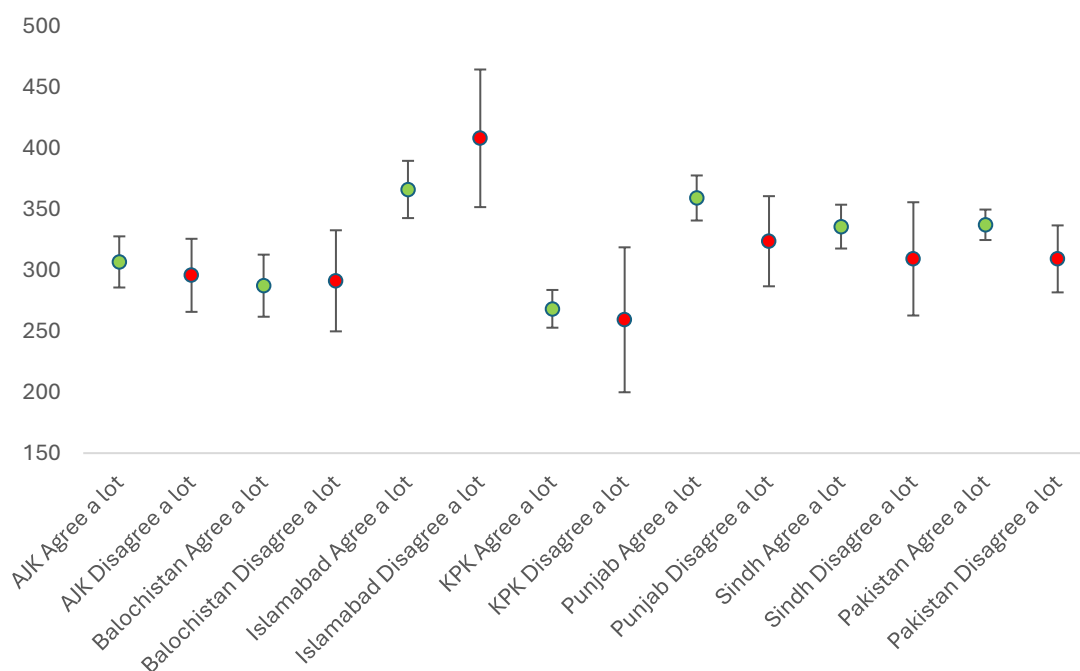


Table 32: Average Reading Scale Score based on student's sense of school belonging

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	82 (2.2)	286-328	10 (1.5)	249-318	4 (0.8)	263-332	5 (1.3)	266-326
Balochistan	70 (3.1)	262-313	21 (2.5)	201-356	6 (1.5)	182-256	4 (0.9)	250-333
Islamabad	72 (2.7)	343-390	20 (2.1)	352-412	4 (0.7)	338-424	5 (1.0)	352-465
KPK	82 (2.8)	253-284	12 (1.8)	234-302	4 (0.9)	189-263	3 (0.9)	200-319
Punjab	83 (2.1)	341-378	11 (1.9)	326-377	3 (0.6)	298-368	3 (0.6)	287-361
Sindh	86 (3.6)	318-354	9 (2.3)	280-363	3 (1.5)	279-418	2 (0.5)	263-356
Pakistan Average	83 (1.5)	325-350	11 (1.3)	307-348	3 (0.5)	282-333	3 (0.4)	282-337

For Mathematics, a similar pattern appears as showcased in Table 33. Those students that “agree a lot” to the statement about enjoying Mathematics have a 95 percent confidence interval of their scores that goes from 374 to 399 while the confidence interval of those that “disagree a lot” to the statement goes from 332 to 378. These intervals are illustrated in Graph 36 below and where for all provinces these intervals overlap. Thus, there is not a statistically significant difference in mathematics scores between those students that feel like they belong to their schools and those that do not feel like they belong to it.

Graph 38: Average Mathematics Scale Score based on student's sense of school belonging

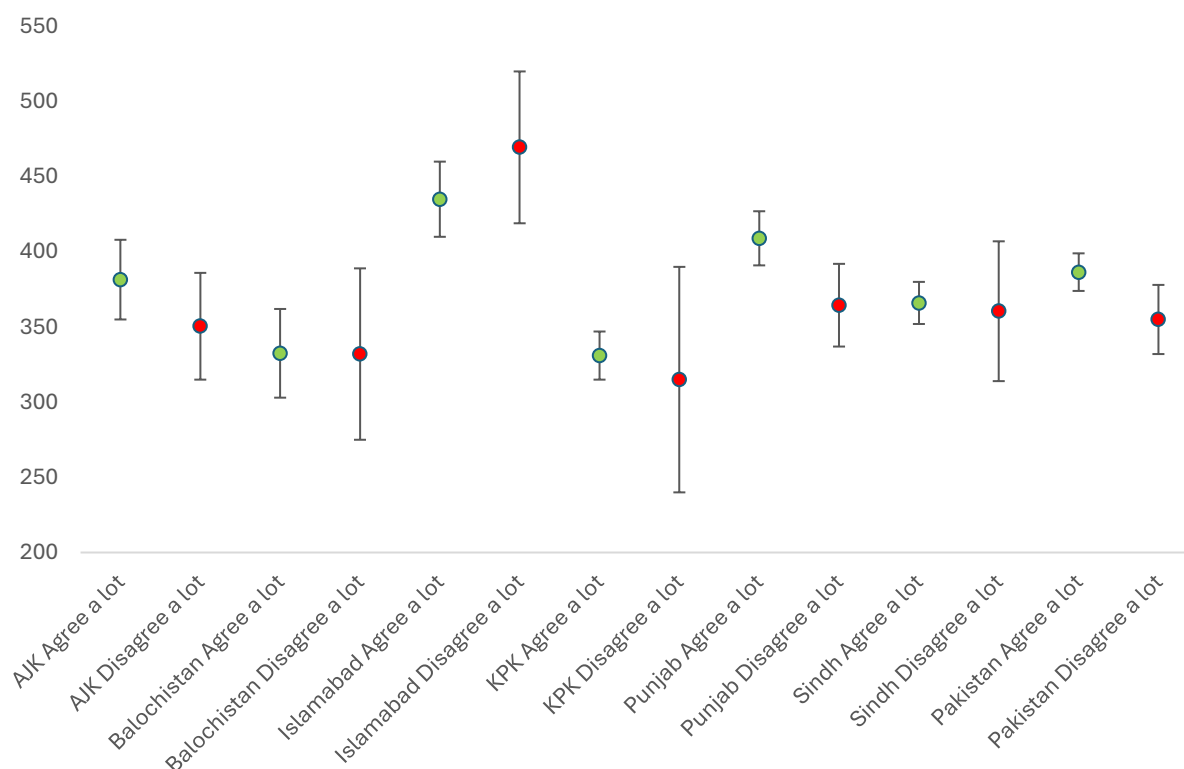


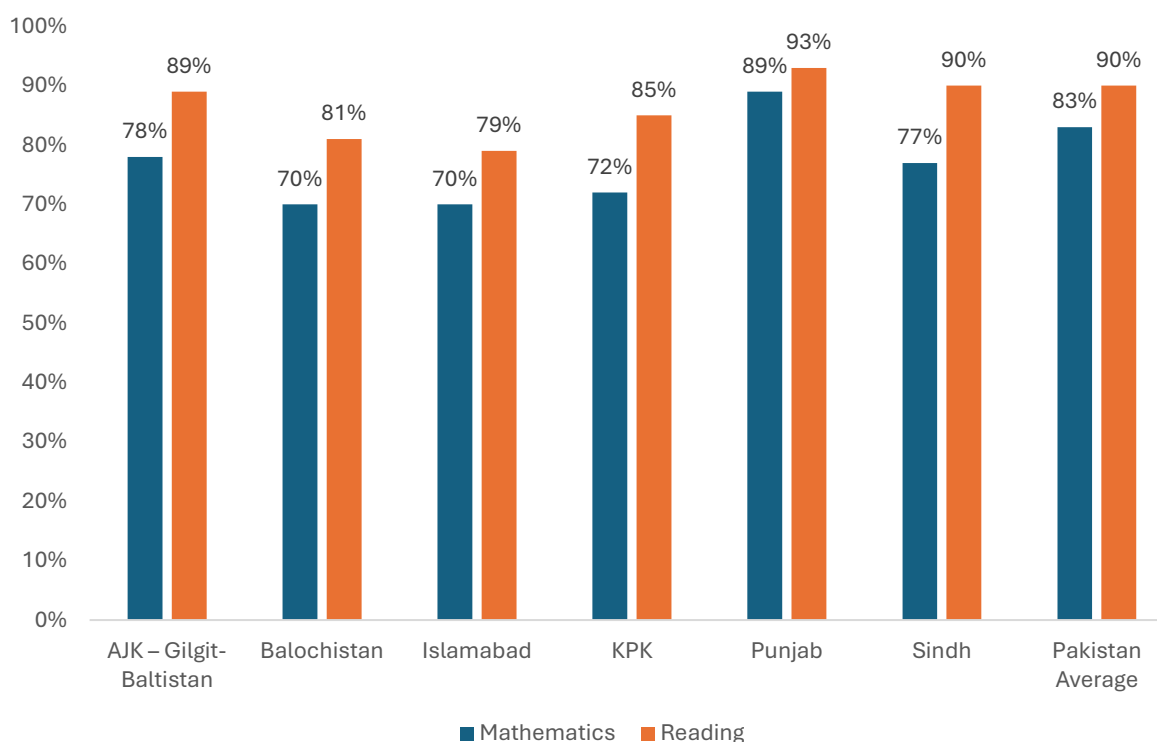
Table 33: Average Mathematics Scale Score based on student's sense of school belonging

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	82 (2.2)	355-408	10 (1.5)	323-409	4 (0.8)	287-381	5 (1.3)	315-386
Balochistan	70 (3.1)	303-362	21 (2.5)	258-400	6 (1.5)	218-293	4 (0.9)	275-389
Islamabad	72 (2.7)	410-460	20 (2.1)	416-472	4 (0.7)	387-487	5 (1.0)	419-520
KPK	82 (2.8)	315-347	12 (1.8)	296-361	4 (0.9)	255-318	3 (0.9)	240-390
Punjab	83 (2.1)	391-427	11 (1.9)	389-430	3 (0.6)	356-411	3 (0.6)	337-392
Sindh	86 (3.6)	352-380	9 (2.3)	322-380	3 (1.5)	306-436	2 (0.5)	314-407
Pakistan Average	83 (1.5)	374-399	11 (1.3)	364-401	3 (0.5)	331-377	3 (0.4)	332-378

Attitudes Towards Reading and Mathematics

Children learn best when they enjoy the process of learning. Graph 39 looks at the attitudes that children have towards reading and doing mathematics. Like it is illustrated below, 90 percent of the students that participated in the exercise report enjoying reading and 83 percent report that they enjoy doing mathematics. Punjab is the province with the highest percentage of students reporting that they enjoy both reading and doing mathematics while Balochistan and Islamabad are the provinces where this percentage is the lowest.

Graph 39: Percentage of students reporting they enjoy reading/mathematics (%)



For reading, the 95 percent confidence interval of the children reporting that they like a lot to the statement about enjoying reading goes from 322 to 349 versus the confidence interval of those that disagree a lot that goes from 268 to 331. The confidence intervals of these two groups overlaps and therefore there is not a statistically significant difference in the reading scores obtained in the assessment between these two groups of students.

Table 34: Average Reading Scale Score by student's attitudes towards reading

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	89 (1.9)	285-324	8 (1.6)	245-323	1 (0.5)	237-356	2 (1.1)	234-314
Balochistan	81 (2.8)	249-335	14 (3.3)	197-282	3 (1.2)	166-293	2 (0.6)	168-335
Islamabad	79 (2.1)	343-393	16 (2.1)	342-408	3 (0.8)	335-439	2 (0.6)	325-477
KPK	85 (2.5)	252-286	13 (2.3)	226-269	1 (0.4)	159-280	1 (0.3)	241-343
Punjab	93 (1.4)	337-374	6 (1.2)	322-367	1 (0.1)	300-399	0 (0.2)	293-372
Sindh	90 (2.7)	316-353	8 (2.1)	296-379	1 (0.5)	235-317	1 (0.7)	165-420
Pakistan Average	90 (1.0)	322-349	8 (0.9)	291-327	1 (0.15)	257-318	1 (0.2)	268-331

In the case of Mathematics, there are notable differences in the scores of these two groups (as shown in Table 35). While the 95 percent confidence interval of those that agree a lot to the statement goes from 373 to 398, the confidence interval that disagree a lot with the statement goes from 297 to 346. The confidence intervals do not overlap, implying a statistically significant difference in mathematics scores between students that enjoy doing mathematics and those that do not enjoy this subject.

Table 35: Average Mathematics Scale Score by student's attitudes towards Mathematics

Province	Agree a lot		Agree a little		Disagree a little		Disagree a lot	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	78 (3.1)	348-398	16 (2.2)	348-428	3 (2.8)	294-421	4 (1.0)	309-396
Balochistan	70 (2.4)	297-366	19 (2.3)	269-372	8 (1.6)	214-438	4 (1.3)	249-330
Islamabad	70 (3.1)	411-461	22 (2.3)	404-465	4 (0.6)	394-490	5 (1.7)	391-464
KPK	72 (3.0)	315-351	21 (2.5)	298-331	4 (0.6)	280-334	3 (1.0)	245-349
Punjab	89 (1.5)	387-422	9 (1.4)	388-431	1 (0.2)	316-416	1 (0.2)	287-405
Sindh	77 (4.0)	349-378	16 (2.6)	344-391	5 (1.9)	315-418	3 (0.9)	280-371
Pakistan Average	83 (1.2)	373-398	13 (1.0)	356-384	2 (0.4)	322-375	2 (0.3)	297-346

Student Absences

Absenteeism can impact the academic performance of students. The student questionnaire has a section where participants are asked how often they are absent from school. Graph 40 displays how students participating in this assessment responded to this question. Overall, 26 percent of students reported missing a class “once a week”, 8 percent selected “once every two weeks”, 17 percent chose “once a month”, 8 percent “once every two months” and 41 percent responded “never or almost never” missing a class. Sindh, Balochistan and AJK/ Gilgit-Baltistan had the highest percentage of students reporting being absent once a week while Punjab and Islamabad are the provinces with the highest percentage of students reporting that they “never or almost never” miss a class.

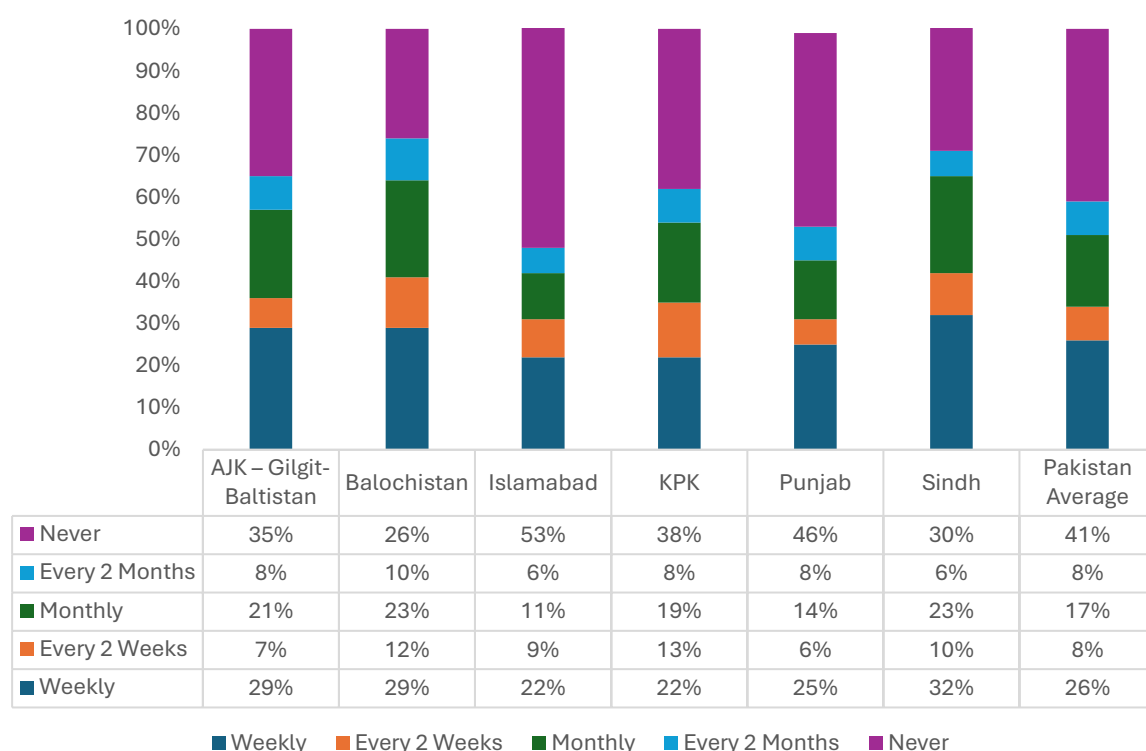
Graph 40: Student Absenteeism (%)

Table 36 looks at the reading scores of students based on the responses to the absenteeism question. Overall, those students that report “never or almost never missing” a class have a 95 percent confidence interval of their reading scores that goes from 331 to 361 while this confidence interval of their reading scores is 301 to 329 for those students that report missing class “once a week”. Graph 41 illustrates these differences and shows how there is no overlap

between the confidence intervals of students in both extremes of the scale that is being used and therefore the difference between these two groups is statistically significant.

Graph 41: Average Reading Scale Score based on student's absenteeism

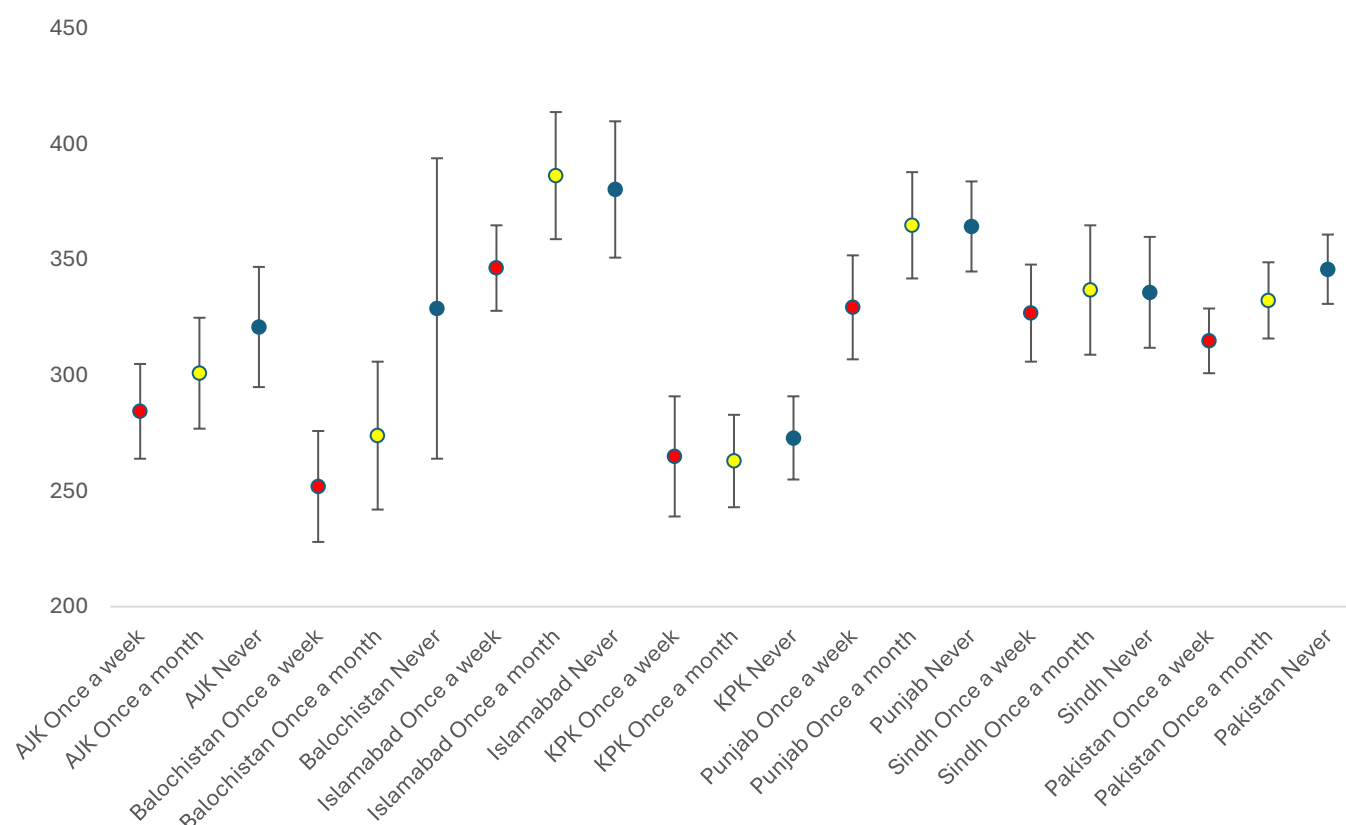


Table 36: Average Reading Scale Score based on student's absenteeism

Province	Once a week		Once every two weeks		Once a month		Once every two months		Never or almost never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	29 (3.8)	264-305	7 (1.1)	251-326	21 (2.5)	277-325	8 (1.8)	258-314	35 (3.4)	295-347
Balochistan	29 (3.5)	228-276	12 (2.4)	214-291	23 (2.9)	242-306	10 (2.2)	217-330	26 (3.6)	264-394
Islamabad	22 (2.1)	328-365	9 (1.1)	317-362	11 (0.8)	359-414	6 (0.9)	316-422	53 (2.4)	351-410
KPK	22 (3.0)	239-291	13 (1.8)	223-271	19 (2.4)	243-283	8 (1.1)	240-283	38 (3.1)	255-291
Punjab	25 (1.9)	307-352	6 (0.7)	313-369	14 (1.6)	342-388	8 (1.8)	331-389	46 (2.6)	345-384
Sindh	32 (2.6)	306-348	10 (1.5)	297-353	23 (4.3)	309-365	6 (0.9)	305-367	30 (4.0)	312-360
Pakistan Average	26 (1.3)	301-329	8 (0.6)	291-324	17 (1.3)	316-349	8 (1.1)	309-358	41 (1.8)	331-361

A similar pattern appears for mathematics as shown in Table 37. The 95 percent confidence interval for mathematics grades for students answering that they “never or almost never” miss a class is 381 to 410 while the interval for those that report missing a class “once a week” is 348 to 376. Graph 42 illustrates these differences and shows how there is not an overlap between the confidence intervals between the groups situated at the extremes of the scale used, implying that there are statistically significant differences in the mathematics scores of these two groups.

Graph 42: Average Mathematics Scale Score based on student's absenteeism

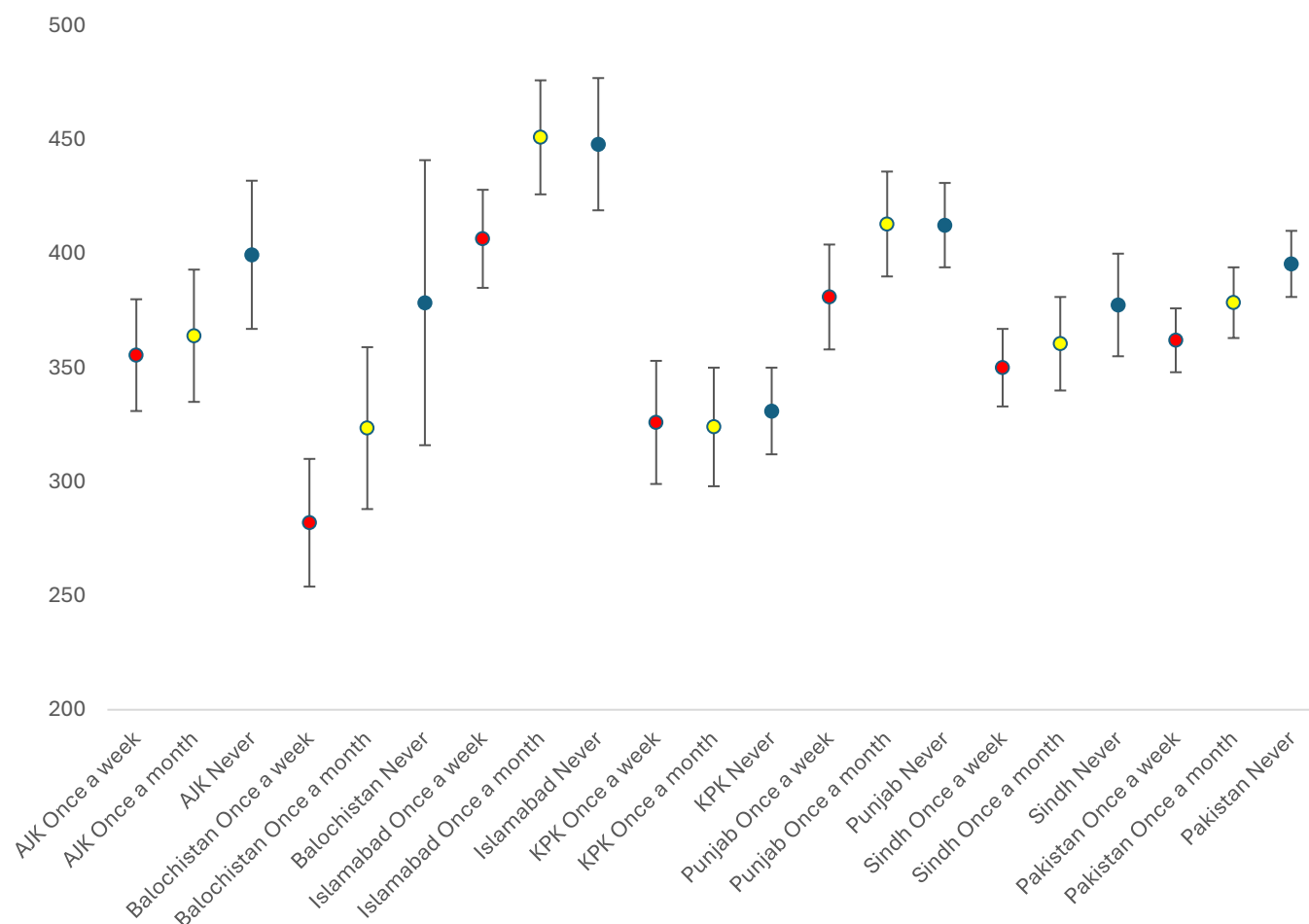


Table 37: Average Mathematics Scale Score based on student's absenteeism

Province	Once a week		Once every two weeks		Once a month		Once every two months		Never or almost never	
	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement	Percent of Students	95% Confidence Interval for Average Achievement
AJK - Gilgit-Baltistan	29 (3.8)	331-380	7 (1.1)	331-414	21 (2.5)	335-393	8 (1.8)	316-387	35 (3.4)	367-432
Balochistan	29 (3.5)	254-310	12 (2.4)	259-345	23 (2.9)	288-359	10 (2.2)	277-376	26 (3.6)	316-441
Islamabad	22 (2.1)	385-428	9 (1.1)	387-436	11 (0.8)	426-476	6 (0.9)	382-489	53 (2.4)	419-477
KPK	22 (3.0)	299-353	13 (1.8)	295-347	19 (2.4)	298-350	8 (1.1)	296-344	38 (3.1)	312-350
Punjab	25 (1.9)	358-404	6 (0.7)	368-426	14 (1.6)	390-436	8 (1.8)	382-454	46 (2.6)	394-431
Sindh	32 (2.6)	333-367	10 (1.5)	333-383	23 (4.3)	340-381	6 (0.9)	339-394	30 (4.0)	355-400
Pakistan Average	26 (1.3)	348-376	8 (0.6)	348-380	17 (1.3)	363-394	8 (1.1)	359-417	41 (1.8)	381-410

Annex

Annex 1: National Characteristics of Pakistan Sample

Fifth Grade

Coverage and Exclusions

- Coverage is 100%
- No school-level exclusions
- Within-school exclusions consisted of students with functional disabilities

Sample design

- Explicit stratification by region (AJK/Gilgit-Baltistan, Baluchistan, Islamabad, KPK, Punjab, Sindh) and school type (public, private)
- No implicit stratification
- Sampled one class per school
- Schools were oversampled at the region and school type levels to enable meaningful comparisons

School Participation Status

Explicit Strata	Total Sampled Schools	Ineligible Schools	Participating Schools			Refusal Schools	Excluded Schools
			Original Schools	1 st Replacements	2 nd Replacements		
AJK—Gilgit-Baltistan—Private	30	0	12	8	8	2	0
AJK—Gilgit-Baltistan—Public	30	0	20	7	3	0	0
Balochistan—Private	30	0	14	8	3	4	1
Balochistan—Public	30	0	18	7	2	3	0
Islamabad—Private	30	2	19	3	6	0	0
Islamabad—Public	30	0	29	1	0	0	0
KPK—Private	30	0	21	5	2	2	0
KPK—Public	30	1	28	1	0	0	0
Punjab—Private	32	0	21	5	4	2	0
Punjab—Public	52	0	48	2	1	1	0
Sindh—Private	30	0	20	4	5	1	0
Sindh—Public	30	0	19	3	4	4	0
Total	384	3	269	54	38	19	1



