

# The Achievement in Mathematics of Learners at Madhyamik Pariksha in Comparison to School Test in West Bengal: An Empirical Study

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## Abstract

In this paper, an investigation had been done to know the achievement status of learners in mathematics in Madhyamik Pariksha (MP) in comparison to school Test in West Bengal irrespective of several categories like region, gender, caste and as a whole. A descriptive type survey was adopted for this study. Total 2927 learners of 22 high/higher secondary schools under West Bengal Board of Secondary Education (WBBSE) from 9 districts in West Bengal were taken as a sample of this study. The major finding of the study is the mean-achievement scores in MP-2020 in all most all categories of rural learners are less increased than that of urban learners in comparison to school Test. Apart from this, the performance in mathematics of general category student was better than any other category. So, special attention was needed for all other categories.

**Key words:** mathematics education, learners, students' achievements, secondary level, rural area, urban area, gender, caste. 2010 Mathematics Subject Classification: 97A99, 97B70, 97D60.

## Introduction

Advanced science and technology make us stand to the threshold of Digital world and digital India. Math as a subject is also responsible for this rapid advancement. In this present situation, specifically, "Digi-Tech" era, every citizen must be accustomed with the knowledge of Mathematics as a perfect citizen, specially, netizen. Math education can easily mould an ideal society along with other wings of education. This will certainly nourish the rational faculty of the learners. The learners should come from every nook and corner of the society, irrespective of region, gender, caste to fulfil the said dream "Education for all". In India, Math is taught as a compulsory subject upto 10<sup>th</sup> standard of schooling. A wrong idea is borne from generation to generation that Math is a difficult subject is to learn for all. Several Boards measure their pupils' performance in Math at secondary level. In particular, Madhyamik Pariksha (MP) is the first Board Examination at secondary level under West Bengal Board of Secondary Education (WBBSE) in West Bengal. The Xth Standard learners of every institution under this Board

appear for a Test at school level before appearing for the MP. So, questions may be raised- “Is the poor performance in mathematics seen of the learners? Is there any inconsistency in the achievement in mathematics of these learners between school Test and MP?” The researchers feel that these learners will play a more active role in building a good nation which is our dream. Since, the researchers, one of whom is ex-deputy secretary (academic), WBBSE and the other is a secondary level mathematics teacher under this Board, so they have emphasized to know the present status of mathematics education of learners in MP in comparison to school Test, irrespective of region, gender, caste etc.

### **Abbreviation**

SC=Scheduled Caste, ST=Scheduled Tribe, OBC-A=Other Backward Class-A, OBC-B=Other Backward Class-B

### **Objective of the Study**

- 1.To find the achievement of the learners in mathematics in MP-2020 on the basis of region, gender, caste.
- 2.To study on the achievement of the learners in mathematics in MP-2020 in comparison to school Test.

### **Sample**

Total 22 high/higher secondary schools of 9 districts (Viz. Kolkata, North-24 Pargana, Nadia, Purba Bardhaman, Bankura, Purulia, Malda, Murshidabad and Jalpaiguri) under WBBSE in West Bengal had been taken as a sample for this study. Among them, 16 schools were situated in rural area and 6 were in urban. They were 11 co-ed., 8 boys and 3 girls. 20 schools were instructed by Bengali, 1 by English and 1 by Hindi. They were also 20 Government Sponsored and 2 Government Aided.

### **Data**

The achievement scores of School Test and MP-2020 of learners in mathematics of 2927 students (boys-1829 and girls-1098) were the raw data of this study.

### **Procedure**

Descriptive type survey was adopted for this study. Two questionnaires were framed for it which are shown in Appendix-A and Appendix-B.

Numbers of learners according to several categories i.e., region, gender and caste were found. Then, the mean-achievement scores of school Test and MP according to region, gender, caste and whole were calculated.

### **Salient Points of the Study**

- 1.The numbers of learners according to several categories like region, gender, caste etc. are presented below in Table-1.

Table-1: Numbers of Learners According to Several Categories

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Category	Gender	Boys					Total	Girls					Total	Grand Total
		SC	ST	OBC-A	OBC-B	General		SC	ST	OBC-A	OBC-B	General		
Urban	Appeared	131	07	09	33	506	686	27	03	05	22	209	266	952
	Passed	13	07	08	33	491	669	27	03	05	22	208	265	934
Rural	Appeared	466	43	77	152	405	1143	383	38	159	67	185	832	1975
	Passed	391	36	62	145	386	1020	277	20	106	61	142	606	1626
Grand Total	Appeared	597	50	86	185	911	1829	410	41	164	89	394	1098	2927
	Passed	521	43	70	178	877	1689	304	23	111	83	350	871	2560

2. The rate of pass in percentage of learners in MP according to several categories like region, gender, caste etc. are presented below in Table-2.

Table-2: Rate of Pass in Percentage of Learners in MP According to Several Categories

1	2	3	4	5	6	7	8	9	10	11	12	13	14
Gender	Boys					Total	Girls					Total	Grand Total
Category	SC	ST	OBC-A	OBC-B	General		SC	ST	OBC-A	OBC-B	General		
Urban	99	100	100	100	97	97.5	100	100	100	100	99.5	99.6	98.1
Rural	83.9	83.7	80.5	95.4	95.3	89.2	72.3	52.6	66.7	91	76.8	72.8	82.3
Composite	87.3	86	81.4	96.2	96.3	92.4	74.2	56.1	67.6	93.3	88.8	79.3	87.5

Table-2 reveals that the rate of pass percentage of whole learners in MP is 87.5 where as 98.1% is passed from urban schools and 82.3% from rural. Here, the pass percentage of boys (92.4%) is higher than that of girls (79.3%).

In urban area, the rate of pass of girls (99.6%) is greater than that of boys (97.5%). But in rural area, it is remarkable that the rate of pass of girls (72.8%) is lesser than that of boys (89.2%). Now, according to all region, gender and caste, the lowest rate of pass is 52.6%. They are all rural ST girls. According to caste, the relationship of the pass percentage of boys is OBC-A<ST<SC<OBC-B<General and that of the girls is ST< OBC-A<SC<General<OBC-B. Afterall, the results for both boys and girls of SC, ST, OBC-A, OBC-B and General of urban area is far better than that of rural area.

3.The numbers of learners and their percentages according to caste i.e., SC, ST, OBC-A, OBC-B and General are presented below in Table-3.

Table-3: Numbers of Learners and Their PercentagesAccording to Caste

1	2	3	4
Gender Category	Boys	Girls	Total and their percentages
SC	597	410	1007 (34.4%)
ST	50	41	91 (3.1%)
OBC-A	86	164	250 (8.5%)
OBC-B	185	89	274 (9.4%)
General	911	394	1305 (44.6%)
<b>Total</b>	1829	1098	2927 (100%)

Table-3 reveals that according to number of learners, it can be written as ST<OBC-A<OBC-B<SC<General. It is remarkable, only the numbers of girls of OBC-A is greater than the number of boys of OBC-A.

4.Out of 100, the mean-achievement scores of school Test and MP-2020 in mathematics of boys of SC, ST, OBC-A, OBC-B, General and Overall, in respect of urban schools, rural schools and composite (urban andrural schools) for passed, failed and both passed & failed in MP-2020 are shown below in Table-4.

Table-4: Mean-achievementScore of Boys of Several Categories

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Category	SC		ST		OBC-A		OBC-B		General		Overall	
	Types of Exam	Test	MP	Test	MP	Test	MP	Test	MP	Test	MP	Test	M P
Passed	Urban	39	51	45	58	40	44	49	60	40	52	40	52
	Rural	31	36	28	28	29	33	37	40	35	41	33	38
	Composite	33	40	31	33	31	35	39	44	38	47	36	44

<b>Failed</b>	<b>Urban</b>	14	18	--	--	19	19	--	--	15	15	15	15
	<b>Rural</b>	14	15	15	16	16	15	16	17	15	17	14	16
	<b>Composite</b>	14	15	15	16	16	16	16	17	15	16	14	15
<b>Passed &amp; Failed</b>	<b>Urban</b>	39	50	45	58	38	41	49	60	39	51	38	49
	<b>Rural</b>	29	33	26	26	27	30	37	39	34	40	31	36
	<b>Composite</b>	31	37	28	31	28	31	38	43	37	46	34	41

Table-4 reveals that the mean-achievement scores of boys in school Test and MP are 34 and 41 respectively i.e., 20.6% score is increased in MP in comparison to school Test. Among boys of urban area, about 29% score is increased in MP in comparison to school Test. In fact, 28.2% score is increased by SC and 28.9% increased by ST, among boys of rural area, about 16% score is increased in MP in comparison to school Test. It is to be noted, 17.7% score is increased by General.

Table-4 reveals that the mean-achievement scores of passed boys in school Test and MP are 36 and 44 respectively i.e., 22.2% score is increased in MP in comparison to school Test. Among the boys who passed of urban area, the mean-achievement score of MP is higher than that of school Test. It is remarkable, 30% score is increased by General, 30% increased by overall and 30.8% score increased by SC. On the other hand, in passed boys of rural area, 15% of score is increased in MP in comparison to school Test.

Again, Table-4 reveals that the mean-achievement scores of the boys who failed in school Test and MP are 14 and 15 respectively i.e., 7% score is increased in MP in comparison to school Test. In failed boys of urban area, the mean-achievement score of both MP and school Test is same which is 15. Here no ST and OBC-B boys of urban schools failed in MP as well as school Test. On the other hand, among failed boys of rural area, 14% score is increased in MP in comparison to school Test.

5. The mean-achievement scores of school Test and MP-2020 in mathematics of girls of SC, ST, OBC-A, OBC-B, General and Overall, in respect of urban schools, rural schools and composite (urban and rural schools) for passed, failed and both passed & failed in MP-2020 are shown below in Table-5.

Table-5: Mean-achievement Score of Girls of Several Categories

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	<b>Category</b>	<b>SC</b>		<b>ST</b>		<b>OBC-A</b>		<b>OBC-B</b>		<b>General</b>		<b>Overall</b>	
	<b>Types of Exams</b>	<b>Test</b>	<b>MP</b>	<b>Test</b>	<b>MP</b>	<b>Test</b>	<b>MP</b>	<b>Test</b>	<b>MP</b>	<b>Test</b>	<b>MP</b>	<b>Test</b>	<b>MP</b>
<b>Passed</b>	<b>Urban</b>	29	33	28	29	26	32	37	38	48	49	34	37
	<b>Rural</b>	19	33	12	21	27	30	17	30	23	38	22	36
	<b>Composite</b>	28	33	26	28	26	32	32	36	33	42	30	37
<b>Failed</b>	<b>Urban</b>	--	--	--	--	--	--	--	--	20	20	20	20
	<b>Rural</b>	14	17	13	14	11	15	17	20	15	15	13	16
	<b>Composite</b>	14	17	13	14	11	15	17	20	15	15	13	16
<b>Passed &amp; Failed</b>	<b>Urban</b>	19	33	12	21	27	30	17	30	23	38	22	36
	<b>Rural</b>	25	29	21	22	21	27	35	36	41	41	28	31
	<b>Composite</b>	24	29	20	22	21	27	31	35	31	39	27	33

Table-5 reveals that the mean-achievement scores of girls in school Test and MP are 27 and 33 respectively i.e., 22.2% score is increased in MP in comparison to school Test. It is remarkable, 28.6% score is increased by OBC-A, 25.8% increased by General. Among girls of urban area, 38.9% score is increased in MP in comparison to school Test. It is to be noted, 65.2% score is increased by General, 73.7% increased by SC, 75% increased by ST, 76.5% increased by OBC-B. Among girls of rural area, about 10% score is increased in MP in comparison to school Test.

Table-5 reveals that the mean-achievement scores of passed girls in school Test and MP are 30 and 37 respectively i.e. 23.3% score is increased in MP in comparison to Test. Among the passed girls of urban area, 8.8 % score is increased in MP in comparison to school Test. It is remarkable, about 14% score is increased by SC and more than 23.07% score increased by OBC-A. On the other hand, among the passed girls of rural area, 63.63% score is increased in MP in comparison to Test. It is remarkable, about 65% score is increased by General, about 74% increased by SC and more than 76% score increased by OBC-B.

Again, Table-5 also reveals that the mean-achievement scores of failed girls in school Test and MP are 13 and 16 respectively i.e. 23.07% score is increased in MP in comparison to Test. Among failed girls of urban area, the mean-achievement score of MP and Test is same which is 20. Here, no SC, ST, OBC-A and OBC-B girls have failed in MP as well as Test. On the other hand, among the failed girls of rural area, the mean-achievement scores in school Test and MP are 13 and 16 respectively i.e. 23.07% score is increased in MP in comparison to Test. Here, 17.64% score is increased by SC and about 36% score increased by OBC-A.

6. The mean-achievement scores of school Test and MP-2020 in mathematics of learners of SC, ST, OBC-A, OBC-B, General and Overall, in respect of passed, failed and composite in MP-2020 are shown below in Table-6.

Table-6: Mean-achievement Score of Learners (both Boys & Girls) of Several Categories

1	2	3	4	5	6	7	8	9	10	11	12	13
Category	SC		ST		OBC-A		OBC-B		General		Overall	
Types of Exam	Test	MP	Test	MP	Test	MP	Test	MP	Test	MP	Test	MP
Passed	31	38	29	31	28	33	37	41	36	46	34	41
Failed	14	16	13	15	12	15	17	19	15	15	14	16
Composite	28	34	25	27	23	28	36	40	35	44	32	38

Table-6 reveals that the mean-achievement scores of MP of all learners are greater than that of school Test. In general, 18.75% score is increased in MP in comparison to Test. It is remarkable that 25.71% score is increased by General. Here, the mean-achievement score of MP of passed learners is higher than that of Test. Here, 20.58% score is increased in MP in comparison to Test. In remarkable, 22.58% increased by SC and 27.77% score increased by General. Again, the mean-achievement score of MP of failed learners is higher than that of Test. Here, 14.28% score is increased in MP in comparison to Test. In fact, no score is increased or decreased by General but 25% score increased by OBC-A.

7. The mean-achievement scores in mathematics of school Test and MP-2020 of learners of several categories (SC, ST, OBC-A, OBC-B, General and Overall) in respect of passed learners, failed learners and composite for both rural and urban schools are shown below in Table-7.

Table-7: Mean-achievement Score of Learners of Several Categories in Rural and Urban Schools

1	2	3	4	5	6	7	8	9	10	11	12	13	14
	Category	SC		ST		OBC-A		OBC-B		General		Overall	
Region	Types of Exam	Test	MP	Test	MP	Test	MP	Test	MP	Test	MP	Test	MP
Urban	Passed	36	48	35	47	35	39	36	48	35	48	35	48
	Failed	14	18	--	--	19	19	--	--	15	15	15	15
	Composite	36	47	35	47	34	37	36	48	34	47	35	47
Rural	Passed	30	35	28	29	27	33	37	40	39	43	34	38
	Failed	14	16	13	15	12	15	17	19	15	15	14	16
	Composite	27	31	23	24	23	28	36	38	36	40	30	34

Table-7 reveals that the mean-achievement scores of MP of all categories of all learners of both rural and urban area are greater than that of school Test. The rate of increased mean-achievement score of urban area is 34.3% in MP in comparison to Test. In remarkable, 30.6% score is increased by SC, 33.3 score increased by OBC-B and 38.2 % increased by General. In rural schools, the rate of increased mean-achievement score is 13.3% in MP in comparison to school Test. It is remarkable, 14.8% score is increased by SC and 21.7% increased by OBC-A.

The mean-achievement scores of all castes of urban area are greater than that of rural area.

The mean-achievement score of overall of rural passed learners is 38 whereas 48 is the mean-achievement score of overall of urban passed learners. But the overall mean-achievement scores of failed learners of urban schools and rural schools are more or less same. No ST and OBC-B of urban school has failed in MP as well as Test.

The relationship on the performance in mathematics in MP of the urban learners according to caste is  $OBC-A < SC = ST = General < OBC-B$  and that of the rural learners according to caste is  $ST < OBC-A < SC < OBC-B < General$ .

### Conclusion

1. In general, 18.75% of the mean-achievement score of learners in mathematics in MP-2020 has been increased in comparison to school Test. The learners and the persons who are related to this can apparently get the pleasure from this finding.

2. According to region/area, the increased rate of mean-achievement score of urban learners in MP in comparison to Test is about 34.3%. On the other hand, 13.3% is increased rate of mean-achievement score of rural learners in MP in comparison to Test. So, it is not at all a healthy situation for the evaluation system.

In general, the mean-achievement score in mathematics in MP of the learners of urban schools is greater than that of rural learners.

3. According to gender, the performance of girls is better than that of boys in mathematics in MP when compared to Test. But the performance of the boys is better than that of girls in mathematics in MP.

4. As a whole, the increased rate of the mean-achievement scores in mathematics in MP in comparison to school Test is graded like  $ST < OBC-B < OBC-A < SC < General$ . The mean-achievement score is 38 out of 100.

The performance of rural girls, rural boys, urban girls and urban boys in mathematics in MP may be graded as  $rural\ girls < rural\ boys < urban\ boys < urban\ girls$ .

5. According to caste, the relationship among the number of learners is  $ST < OBC-A < OBC-B < SC < General$ . But the relationship according to achievement in mathematics in MP is  $ST < OBC-A < SC < OBC-B < General$ . The performance in mathematics of general category student is better than any other category. So, special attention is needed for several castes according to the above findings.

**Further Study**

To find out the causes-why the mean-achievement scores in MP in all most all categories of rural learners are less increased than that of urban learners in comparison to school Test.

**References**

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**Appendix-A**

**QUESTIONNAIRE-1  
(FOR MP-2020 PASSED STUDENTS)**

**SCHOOL GENERAL INFORMATION**

**School's**

**Name:**..... **P.O.**.....

**District:**..... **State-** West Bengal, **PIN**..... **Contact No.**

.....

**Types of Schools:** Govt./Govt. Aided/Govt.Sponsored/Private; **Area:**

Municipality/Panchayat/.....

**Category:** Boys/Girls/Co-ed. **Medium:** Bengali/English/Others (Please specify).....

**MP-2020 RESULT**

Total No. of Students Appeared	No. of Passed Students	No. of Failed Students



**Please fill up the following format only the students who have passed in MP-2020**

Sl. No.	Name of the Student	Male (M)/Female (F)	Category SC/ST/OBC-A/ OBC-B/General	Marks Obtained in MATHEMATICS out of 100	
				Test	MP-2020

**Note:** If the number of students is more than 35, then please use separate sheet of the same.

Date: \_\_\_\_\_ Common Seal \_\_\_\_\_ Signature of Head of the Institution \_\_\_\_\_

**Appendix-B**

**QUESTIONNAIRE-2  
(FOR MP-2020 FAILED STUDENTS)**

**SCHOOL GENERAL INFORMATION**

**School's Name:**..... **P.O.**.....  
 .....  
**District:**..... **State-**West Bengal, **PIN**..... **Contact No.**.....  
 .....  
**Types of Schools:** Govt./Govt. Aided/Govt. Sponsored/Private; **Area:**  
 Municipality/Panchayat/.....  
**Category:** Boys/Girls/Co-ed. **Medium:** Bengali/English/Others (Please specify).....

**MP-2020 RESULT**

Total No. of Students Appeared	No. of Passed Students	No. of Failed Students

Please fill up the following format only the students who have failed in MP-2020

Sl. No.	Name of the Student	Male (M)/Female (F)	Category SC/ST/OBC-A/OBC-B/General	Marks Obtained in MATHEMATICS out of 100	
				Test	MP-2020

**Note:** If the number of students is more than 35, then please use separate sheet of the same.

Date:

Common Seal

Signature of Head of the Institution