A Study on Status of Mathematical Education at Degree Colleges in West Bengal

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Abstract : In this paper, an attempt has been made to study status of mathematical education at degree level in West Bengal, India. For this study, descriptive research design- normative survey research method has been applied on four degree colleges including one women's college under different universities of West Bengal. The findings of the analysis of survey data have been presented.

Keywords : Mathematical education, major subject, degree colleges, West Bengal, survey research, present status.

1   Introduction

In our older concept, knowledge of higher mathematics is required for studying physics. But, in the last few decades there has been a revolution in respect of applications of higher mathematics in the development of other subjects. Presently it is hard to find out a subject where the applications of mathematical

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concepts are not required. So teaching-learning of this subject is very important in respect to research and development of a country. Generally higher education starts at the college level. Here the subject mathematics is offered in two ways: one as an allied subject or a minor subject and the other as a major subject or honours subject. Mathematics as a minor subject naturally fulfills the purpose as a service subject and mathematics as a major is meant for the deeper understanding of the subject leading to the creations of man power who will be involved in teaching and research in the subject.

The fact that India has become the third largest country in higher education system in the world (after China and the USA) suggests that there is a great role of mathematics involved in the process (Ramanujam, R) [1]. In this regard, Curriculum Development Committee (2001) of University Grants Commission updated/framed the model curriculum of mathematics at the undergraduate and post graduate levels [2]. However, no significant study on the status of mathematical education at college level is found.

In this paper, the researchers have tried to get some idea of present status of mathematics education at the under graduate level through data analysis of four colleges in West Bengal.

1.1   Objective

To study present status of mathematics education at undergraduate level of four colleges in West Bengal.

2   Methodology

In present study Normative Survey Research Method was adopted.

Population:
The population of the present study comprises of all degree colleges where the students studied Mathematics Honours in West Bengal.

Sample:
For the present study, four (4) departments of mathematics of four degree colleges including one women's college under two state universities of West Bengal were selected as an incidental sample.

Tool:
Tool for the present study was prepared by the researchers. Tool (Please see: Annexure-A) was used for the present study to collect data from the sample degree colleges.

Data Collection:

Filled up survey research forms for the study of the present status of Mathematics Education were collected by one of the researchers from four colleges. Here the data of the each survey research form are the data for the present study.

3   Data Analysis and Major Findings

Profile of Teachers:

The details according to age groups of teachers and percentage of male and female of each age group are shown in Table-1.

<div align="center">Table-1: Age of Teachers (In percentage)</div>

1	2	3	4	5	6	7	8
S. No.	Age	No. of Teachers					Remarks
		A	B	C	D	Total	
1	Upto 30	3	2	3	–	8	40% were male and 13.3%were female
2	31-35	–	–	–	–	–	0% was male and 0% was female
3	36-40	–	–	–	–	–	0% was male and 0% was female
4	41-45	–	1	1	–	2	13.3% was male and 0% was female
5	46-50	–	–	–	–	–	0% was male and 0 % was female
6	51-55	–	2	1	–	3	13.3% were male and 6.6%were female
7	56-60	–	–	–	2	2	6.6% were male and 6.6%were female

Table-1 reveals that there are no. of teachers 8, 2, 3 and 2 which belong in the age groups upto 30, 41-45, 51-55, 56-60. More than 50% of teachers are in upto 30 age group. They are all guest teachers and part time teachers. Here no. of female teacher is less than the no. of male teacher.

The highest qualification and professional qualification of the teachers and their different types and numbers and number of approved post of mathematics department of four colleges are given in Table-2.

Table-2: Educational and professional qualifications of different types of existing teachers of mathematics departments of four colleges

1	2	3	4	5	6	7
College	Total no. of approved post	Highest Qualifi-cation	Male (Type of teacher)	Female (Type of teacher)	Total	Remarks
A	3	Ph.D. M.Phil. M.Sc.	– – 1(GT)	– – 2(GT)	– – 3	One male teacher has gate & one female teacher has B.Ed
B	4	Ph.D. M.Phil. M.Sc.	1(AOP) – 3(ATP-1+ PTT-2)	1(AOP) – –	2 – 3	
C	4	Ph.D. M.Phil. M.Sc.	2(AOP-1+ ATP-1) – 3(GT)	– – –	2 – 3	One has B.Ed, M.Phil & one has SLET One has B.Ed.
D	2	Ph.D. M.Phil. M.Sc.	1(AOP) – –	1(AOP) – –	2 – –	
Total	13		11	4	15	

Here, AOP=Associate Professor, ATP=Assistant Professor, GT=Guest Teacher, PTT=Part Time Teacher

It is clear from Table-2 that no. of approved permanent teacher in the departments of mathematics of four colleges is 7 where as no. of approved post is 13. On the other hand, 6 guest teachers and 2 part time teachers are appointed in the departments except the department of college D. It is important that there is no permanent teacher in the college A. Only 40% teachers have Ph.D. Degree. There is no Ph.D. Degree holder teacher in College A.

Profile of Students: The students' enrolment in mathematics (honours) categorically in the departments of mathematics of four colleges in 2012 is presented in Table-3.

Table-3: Students' enrolment in mathematics (honours) in 2012

College	Category	1st Year		2nd Year		3rd Year		Remarks
		Male	Female	Male	Female	Male	Female	
A	General	06	01	06	02	04	01	1male
	SC	04	01	04	01	02	–	general
	ST	–	–	–	–	–	–	student
	OBC	04	–	06	01	01	–	is PH
	Total	14	02	16	04	07	01	
B	General	25	03	24	01	20	01	
	SC	05	01	01	–	–	–	
	ST	–	–	–	–	–	–	
	OBC	–	–	–	–	–	–	
	Total	30	04	25	01	20	01	
C	General	48	08	39	19	27	11	
	SC	08	–	07	02	04	–	
	ST	–	–	–	–	–	–	
	OBC	06	–	03	01	–	–	
	Total	62	08	49	22	31	11	
D	General	–	05	–	08	–	21	
	SC	–	–	–	03	–	–	
	ST	–	–	–	–	–	–	
	OBC	–	–	–	–	–	–	
Total		–	05	–	11	–	21	

Table-3 reveals that no ST male and female students took admission in mathematics (honours). There were no students of OBC category who took admission in the departments of mathematics of college B and D. It is important that the yearly rate of admission were decreasing in the department of College D i.e. Women's College. There were 345 students (male-254 &female-91) in mathematics (honours) in four colleges in 2012. Only one student was physically handicapped.

Profile of Students' Status:

The intake capacity, students' enrollment, students' appearance in the examination and their performance are presented in Table-4.

Table-4: Status of the students in the departments of mathematics

1	2	3	4	5	6	7	8	9	10	11	12
College	In take capacity (2009)	Total no. of students admitted in 2009	Total no. of students appeared in the university Part-1 math honours in 2010	No. of Students qualified in math honours Part I in 2010 who passed in Pass subjects	No. of Students qualified in math honours Part I in 2010 who did not pass in Pass subjects	Total no. of students admitted in math honours 2nd year in 2010	Total no. of students appeared in the university Part-II math honours in 2011	No. of Students qualified in math honours Part II in 2011	Total no. of students admitted in math honours 3rd year in 2011	Total no. of students appeared in the university Part-III math honours in 2012	No. of Students qualified in math honours Part III in 2012
A	60	57	33	01	8	09	08	07	07	06	03
B	50	50	33	20	3	33	28	25	33	25	16
C	80	73	64	42	4	64	64	44	49	49	35
D	20	15	13	6	5	11	11	8	11	5	4
Total	210	195	143	69	20	117	111	84	100	85	58

It is clear from Table-4, in 2009, total 15(210-195) seats were vacant, 52(195-143) were not appeared in part-I examination 2010. 48.25% students qualified in mathematics (honours) part-I in 2010 who passed in pass subjects and 13.98% students qualified who did not pass in pass subjects. In part-II in 2011, percentage of qualified students in respect of appeared students was 75.67%. Percentage of qualified students in respect of appeared students was 68.23% in Part-III, 2012. The rate of successful as well as qualified students in respect of intake capacity, admission and appearance in Part-I were 27.61%, 29.74% and 40.55% respectively. The rate of pass in mathematics (honours) of college A, B, C and D in respect of their admissions were 5.26%, 32%, 47.94% and 26.66% respectively. These results express that the students' achievement at degree level is poor. Only the students of college C performed the better result.

4   Conclusion

1. Deficiency of the approved permanent teacher is indicated as a problem for smooth running the department. The students' achievement of the department of mathematics of college A, which is run by the guest teacher, is very poor. So it may be concluded that the permanent teaching staff is essential in the departments.

2. It has been shown that only 2 permanent teachers took classes in the mathematics department of college D. The students' performance of that department was improved than that of college A but not much satisfactory. This shows that 2 permanent teachers are not sufficient for taking class load of teaching under graduate mathematics. So, sufficient number of teacher is a must for mathematics department.

3. No ST student was admitted in the departments. In general, the rate of admission of female students was low. Specially, in Women's College C, the rate of admission of the students was in decreasing order. This tendency is harmful for mathematics education.

4. The students' achievements in mathematics are not satisfactory in four colleges. Only the college C performs relatively better.

Further Research:

1. This study may be extended to large number of samples covering different universities of India.

2. Finding the causes of failure of students in mathematics education at degree level in detail and suggesting the proper direction to eradicate the cause of failure.

5   Acknowledgement

References

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Appendix-A

Survey Research Form

Name of the College :

Year of Establishment of the College:

Address of the College:

Affiliated University :

Faculty Status (Department of Mathematics)

Year of Establishment of Mathematics Hons. In the College:

1. Total No. of approved posts in the dept. of Mathematics:

2. Total No. of existing present teachers in the department of Mathematics:

Sl. No.	Name of the teacher	Designation Asstistant Professor/ Asso. Prof./ PTT/ CWTT/ Guest Teacher/ Superannuated Teacher	Date of Birth	Age on 1.1.2013	Male/ Female	Highest Qualification	Extra Qualification	Teaching Experience

Total No. of students in Math Hons. 1st year in 2012:

Male Students	Female Students	Total Students
General:	General:	General:
S.C.	S.C.	S.C.
S.T.	S.T.	S.T.
O.B.C.	O.B.C.	O.B.C.
PH	PH	PH
Total:	Total:	Total:

Total No. of students of 2nd year in 2012:

Male Students	Female Students	Total Students
General:	General:	General:
S.C.	S.C.	S.C.
S.T.	S.T.	S.T.
O.B.C.	O.B.C.	O.B.C.
PH	PH	PH
Total:	Total:	Total:

Total No. of students in Math Hons. 3rd year in 2012:

Male Students	Female Students	Total Students
General:	General:	General:
S.C.	S.C.	S.C.
S.T.	S.T.	S.T.
O.B.C.	O.B.C.	O.B.C.
PH	PH	PH
Total:	Total:	Total:

Total No. of students in Math Hons.1st +2nd + 3rd year in 2012:

Status of the Students in the Department of Mathematics:

Total No. of students admitted in Math Hons 1st year in 2009	Total No. of students appeared in the University Part-I Math Hons. in 2010	No. of Students qualified in Mathematics Hons Part I in 2010 who passed in Pass subjects also	No. of Students qualified in Mathematics Hons Part I in 2010 who did not pass in Pass subjects
		Marks obtd. in Hons. Above 60%- Between 40-59%- Total qualified-	Marks obtd. in Hons. Above 60%- Between 40-59%- Total qualified-
Total No. of students admitted in Math Hons 2nd year in 2010	Total No. of students appeared in the University Part-II Math Hons. in 2011	No. of Students qualified in Mathematics Hons Part II in 2011	
		Marks obtd. in Hons. Above 60%- Between 40-59%- Total qualified-	
Total No. of students admitted in Math Hons 3rd year in 2011	Total No. of students appeared in the University Part-III Math Hons. in 2012	No. of Students qualified in Mathematics Hons. Part III	
		Marks obtd. in Hons. Above 60%- Between 40-59%- Total qualified-	

Number of students who has got chance in M.Sc. from passed

Mathematics Hons. Part III students in 2012   :

Percentage of students who has got chance in M.Sc. from

passed Mathematics Hons. Part III students in 2012   :

Percentage of students who has got chance in M.Sc.in a year (In general)   :

Percentage of students to qualify School Service Commission each year in Mathematics:

Signature of the Principal/T.I.C./Head of the department of Mathematics (With Seal)