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RESEARCH ARTICLE

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ATTITUDE OF STUDENTS TOWARDS ICT BASED MATHEMATICS EDUCATION

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ABSTRACT

ICT is the base of modern education system. It helps us to provide a quality full education. In present time mathematics education depend on ICT. ICT provide a quality full mathematics teaching and learning. As like a developing country there is lack of technology, internet access, and qualified trainers act as the challenge in providing ICT based education in India. Information communication technology (ICT) is recognized as an important tools for education also mathematics education. In the modern time period ICT play an important role to teaching and learning. Mathematics learning through ICT increases interest of students. Also it helps to better understand for Mathematics education. But at present time rural areas students are less developed then urban areas students to use ICT for learning mathematics. ICT based Mathematics education provide interesting Mathematics learning. Also provide easy Mathematics learning. But in urban area students use more ICT to learn mathematics then rural.

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INTRODUCTION

The ancient education system of India was primarily based on the Gurukul system. But now a day Indian education has undergone various stages from the Vedic age to the post independence period. Modern education is not restricted within the class room. Information and communication technology (ICT) plays a crucial role in this respect also for mathematics education. It is treated as the integral part for educational reforms and innovations at secondary and higher secondary level school. The national policy on education (1986) has modified 1992, stressed upon employing education technology to improve the quality of education. The policy statement led two major centrally sponsored schemes, namely, Educational Technology (ET) and computer literacy and studies in school (CLASS) paving the way for a more comprehensive centrally sponsored scheme Information for a more communication Technology (ICT I in short) of schools. Bhattacharyya, (2011) was conducted a study on "A comparative study on uses of ICT tools by Teacher Education". Here he studied about subject wise variance to use ICT, gender wise variance to use ICT and study about uses of ICT among senior and junior. The research method used by researcher was descriptive survey method.

Been *et al.*, (2012) was conduct a study on "A study on the ICT awareness of M.Ed. trainees". The main objective of the research was about the study of ITC awareness of M.Ed. trainees and studied the effect of gender type of management of the institute on the ICT awareness. Here there searcher used descriptive survey method. He used 60 M.Ed. students, among them 15 was male and 45 was female. The researcher was found that male M.Ed. students poses significantly higher awareness of ICT in education then female M.Ed. students. Management of the M.Ed. College does not effect on the awareness of use of ICT in education. Kundu, (2018) was conducted a study on "Prospects of ICT integration in school education: An analytical study of the government school in West Bengal, India. The main objective of the research was to find out the impact of ICTs in school education, to compare the views of teachers' educator regarding effect of ICT in improving quality of education, to find the barriers in the path of successful ICT integration in school education system and to suggest the best possible policy. Here the researcher had collected data by descriptive survey method; a well structured questionnaire has been used to collect primary data from seventy five secondary schools in several districts in West Bengal. Rani *et al.*, (2018) conducted a study on "Role of ICT to enhance Mathematics teaching and to raising educational standards". Here the main

objective of this research was improvement in mathematics learning, increase achievement in different education reduce of illiteracy rate, emphasize female literacy, expansion of provisions of basic education and training in other essential skills required children and increased acquisition by individuals, families of the knowledge, skills and values required for better living and sound and sustainable development. Sahin, (2018) was conducted a study on “A Critical Survey on the Involvement of ICT in the Teachers Training Institute of West Bengal”. The main objective of this research was to find out the difference between male and female teacher to uses of ICT. Also find the difference between government and non government teachers training institute in implementation the use of ICT in the class room. Finally find out the factors that create a problem in the implementation of ICT in teacher education institutes. Here the researcher used descriptive study (survey method). The researcher got the result that urban area college was more developed than rural area and there was no significant between male and female. Sarkar, (2015) was conducted a study on “A survey on the use of ICT in teaching learning practices in college level mathematics”. Here the main objective of this research weather there is any difference in the options of the students and teachers about the use of ICT in enhancing the learning of the students of mathematics, whether there is any difference in the opinions of the students and teachers about the use of ICT in improving the mathematical problem solving skills, whether there is any difference in the opinions of the students and making the students interested in learning mathematics. Here the researcher used descriptive survey method for this research. Total 112 online responders performed for this research. Among them 82 students and 30 teachers got participate.

The researcher finds that there is no significant difference in the opinions of students and the teachers about the ICT in enhances the effectiveness of teaching of mathematics, improving skills for solving mathematical problems and making students interested in learning mathematics. Sivakova *et al.*, (2017) was conducted a study on “ICT the Educational Programs in Teaching Mathematics”. Here the main objective of this study was to find the intensity about ICT uses to solve integers ,geometric , problem solving and working with data for student also teachers. The researcher used descriptive survey method to prepare this research paper. The researcher was conducted in sixteen primary schools in the country. The population of this research consists of 242 primary teachers surveyed about there views of the use of ICT educational programs in teaching mathematics from the first to fifth grade while processing the content on topic integer, geometry , problem solving and working with data. Here the researcher got the result that the uses of ICT educational programs in teaching mathematics resolve the problem situation and facility the adoption of the mathematical concepts. Thakur, (2014) was conducted a study on “A Study on awareness of trained teachers in relation to information and communication technology”. The main objective of the study was about the level of ICT awareness among the trained teachers, compare the level of awareness about ICT among male and female trained teachers and compare the level of ICT awareness among rural and urban trained teacher. The researcher was taken 300 secondary school teachers among 30 school 50 teachers from 5 rural and 50 teachers from 5 urban schools from each three district such as Malda, North Dinajpur and South Dinajpur of West Bengal. Here the researcher was used descriptive survey method to collect data. The researcher got the result that there was no significant difference between male and female trained teachers. Also there was a significant difference between the urban and rural areas trained teacher.

Statement of the problem: “Attitude of Students towards ICT based Mathematics Education at Secondary Level”.

Significance of the study: At present time this type of research have many significance to Develop Mathematics education. In one way modern technology helps to better communication between students and teachers, on the other hand it helps to better understanding of lesson to the students. ICT based Mathematics education helps to think abstract among the students. It increases the interest level of

student. Since ICT based Mathematics education is a interesting Math education system, so it helps to increase students attendance in the class. Also ICT based Mathematics education reduces the number of school breaker.

Objective of the study

- 1) To find out the attitude of boys students to words ICT based Mathematics education.
- 2) To find out the attitude of girls students to words ICT based Mathematics education
- 3) To find out the attitude of boys students to words ICT based Mathematics education on rural area.
- 4) To find out the attitude of girls students to words ICT based Mathematics education on rural area.
- 5) To find out the attitude of boys students to words ICT based Mathematics education on urban area.
- 6) To find out the attitude of girls students to words ICT based Mathematics education on urban areas.
- 5) To check whether the syllabus of secondary level could suitable interest about uses of ICT in Mathematics teaching and learning
- 6) To develop suitable programs for remedial work in bases of ICT.
- 7) Find out whether the use of ICT tools motivates and makes students interested in learning mathematics.

Hypotheses of the study

- Ho1.** There is no significant difference between rural boy and rural girl students.
- Ho2.** There is no significant difference between urban boy students and urban girl students.
- Ho3.** There is no significant difference between rural boy students and urban boy students.
- Ho4.** There is no significant difference between rural girl students and urban girl students.
- Ho5.** There is no significant difference between rural area students and urban area students.

Research questions

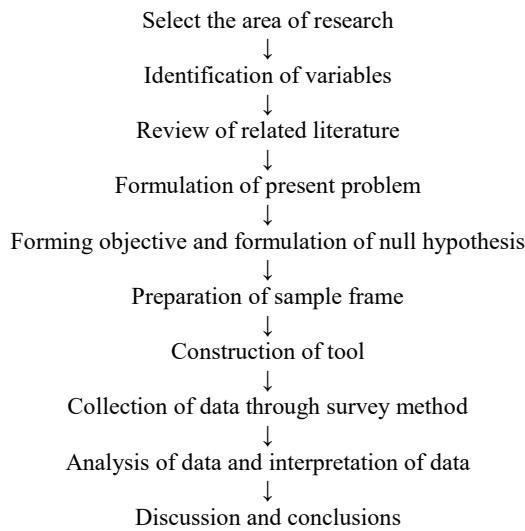
- 1) How much interested are the boys students to words ICT based Mathematics education?
- 2) How much interested are the girls students to words ICT based Mathematics education?
- 3) Among the boys students how much belongs to rural area?
- 4) Among the girls students how much belongs to rural area?
- 5) Among the boys students how much belongs to urban area?
- 6) Among the girls students how much belongs to urban area?
- 7) Does the syllabus of secondary level is suitable for ICT based Mathematics education?
- 8) Are the Mathematics teachers of West Bengal government school interested to give his/her teaching through ICT based?

Delimitation of the study:

- 1) Population of the study was consist of Bengal medium Govt. Secondary School (class IV and X) of West Bengal.
- 2) The study was delimited to district North 24 Pargana and purba Burdwan. The study was delimited to rural and urban areas of both district.
- 3) The study was delimited to Male and Female students of both district.
- 4) Students were selected through purposive sampling method.
- 5) All data wear collected through various coaching center from those district at lockdown situation by what's app media.

Research design of the study

The present study was done through descriptive survey study i.e., it was a quantitative study. The research design which is a follows:



Method applied: The present work is a survey study investigation the role of major variables as attitude of students towards Mathematics education on ICT based, categorical variables as locality (Rural and Urban), gender (Male and Female). The sample in this study consists of 80 school students from secondary level.40 students from rural areas among them20 are boys and 20 are girls Students. And other 40 students from urban areas, among them 20 are boys and 20 are girls. The questionnaire method applied by me.The data is collected from various coaching center by questionnaire.

Variables in the study: The purpose of the study is to investigate the relationship between a set of independent variables i.e. gender (Male and Female), locality (Rural and Urban) and attitude of students towards ICT based Mathematics education (department variable). Our selected variables are given below:

Major variables:

1. Attitude of students towards ICT based Mathematics education

Categorical variables:

2. Locality - (i) Rural and (ii) Urban
3. Gender- (i) Male and (ii) Female

Population of the study: The population of the present study is to identify the purpose of the investigation. The population of this study was all the students of Bengali medium school of class IX and X the academic year 2020 of North 24 Parganas, Purba Bardhaman and kolkata district of West Bengal affiliated by W.B.B.S E.

Sample size of the study: The students who have interested towards ICT based Mathematics education were found through inventory which was used for the present investigation. Here the sample selected by random sampling method. The sample size of the study is 80 students from secondary level school at West Bengal.

Tools of the study: The research tool occupies a major role in research study because it is useful in the collection of data to draw meaningful conclusion. A questionnaire prepared by the researcher with 26 items. and this is standardized by some experts.

Procedure of data collection: The quantitative data collection through the administration of the tool on selected raw data. The data is tabulated, analyzed, and interpreted for drawing sound conclusion. Statistical method applied for analysis of the data included descriptive statistics.

Software used: Analysis and interpretation of this study completed with the help of Microsoft office Excel 2007 and Microsoft office Word 2007.

Analysis and Interpretation: A. We have chosen 20 boys and 20 girls from the rural area and response of 26 questions are given in the following table.

Table 1. Rural Boys Vs Rural Girls

Question	Boys		Girls	
	Yes	No	Yes	No
1	11	9	12	8
2	14	6	14	6
3	17	3	16	4
4	20	0	18	2
5	20	0	20	0
6	8	12	6	14
7	7	13	6	14
8	4	16	5	15
9	7	13	7	13
10	0	20	0	20
11	20	0	20	0
12	0	20	0	20
13	0	20	18	2
14	19	1	14	6
15	20	0	15	5
16	7	13	7	13
17	1	19	0	20
18	6	14	7	13
19	1	19	0	20
20	0	20	0	20
21	15	5	16	4
22	12	8	11	9
23	16	4	15	5
24	12	8	10	10
25	13	7	12	8
26	12	8	11	9

Now we analyze the above data with respect to the following column diagram and correlation table.

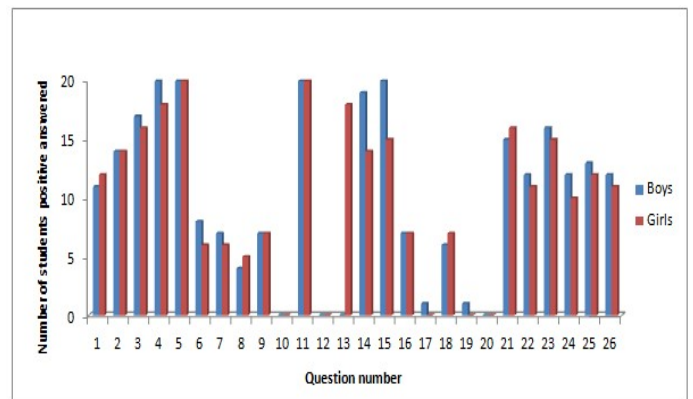


Figure 1. Positive answered by rural boys and girls

Tanle 2. Correlation table for rural boys and girls

	Boys	Girls
Boys	1	
Girls	0.83365276	1

From the above figure-1 and table-2, we have shown that there are no significant differences between rural boys and rural girls attitudes towards ICT based mathematics learning. B. We have chosen 20 boys and 20 girls from the urban area and response of 26 questions are given in the following table. Now we analyze the above data with respect to the following column diagram and correlation table. From the above figure-2 and table-4, we have shown that there are no significant differences between urban boys and urban girls attitudes towards ICT based mathematics learning. Next we compare the attitude toward ICT based mathematics among rural boys vs. urban boys and rural girls vs. urban girls with the following column diagrams and correlation tables.

Table 3. Urban Boys Vs Urban Girls

Question	Boys		Girls	
	Yes	No	Yes	No
1	17	3	15	5
2	19	1	17	3
3	20	0	20	0
4	20	0	20	0
5	20	0	20	0
6	19	1	18	2
7	13	7	15	5
8	19	1	17	3
9	20	0	20	0
10	0	20	0	20
11	20	0	20	0
12	20	0	20	0
13	0	20	0	20
14	20	0	20	0
15	20	0	20	0
16	20	0	20	0
17	9	11	7	13
18	20	0	20	0
19	9	11	7	13
20	7	13	6	14
21	20	0	20	0
22	20	0	18	2
23	19	1	18	2
24	19	1	19	1
25	20	0	20	0
26	20	0	20	0

From the above Figure-3 and Table-5, we have shown that there are quite significant differences between rural boys and urban boys attitudes towards ICT based mathematics learning.

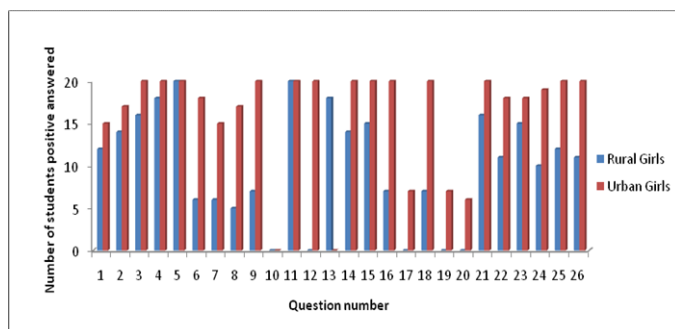


Figure 4. Positive answered by rural girls and Urban girls

Table 6. Correlation table for rural girls and urban girls

	Rural Girls	Urban Girls
Rural Girls	1	
Urban Girls	0.431353935	1

From the above figure-4 and table-6, we have shown that there are significant differences between rural girls and urban girls attitudes towards ICT based mathematics learning.

Major findings

- There is no significant difference between rural boys students and rural girls students in the context of ICT based Mathematics education for secondary level of West Bengal government school.
- There is no significant difference between urban boys students and urban girls students in the context of ICT based Mathematics education for secondary level of West Bengal government school.
- There is a long difference between rural boys students and urban boys students in the context of ICT based Mathematics education for secondary level of West Bengal government school.
- There is a long difference between rural girls students and urban girls students in the context of ICT based Mathematics education for secondary level of West Bengal government school.
- There is a long difference between rural students and urban students in the context of ICT based Mathematics education for secondary level of West Bengal government school.

DISCUSSION

We have seen from the table no 1 & 2 and figure-1, that there are no significant difference between rural boys students and rural girls students about primary knowledge of ICT based Mathematics education, about home infrastructure students to ICT based Mathematics education and about students interest on ICT based Mathematics education. We have seen from the table no 3 & 4 and figure-2, that there are no significant difference between rural boys students and rural girls students about School infrastructure of students to ICT based Mathematics education, about home infrastructure students to ICT based Mathematics education and about students interest on ICT based Mathematics education. We have seen from the table no 5 and figure-3, that there are quite significant differences between rural boys students and urban boys attitudes towards ICT based mathematics learning. We have seen from the table no 6 and figure-4, that there are significant differences between rural girls students and urban girls attitudes towards ICT based mathematics learning. From the above discussion we see that in rural areas students have low concept about ICT based Mathematics

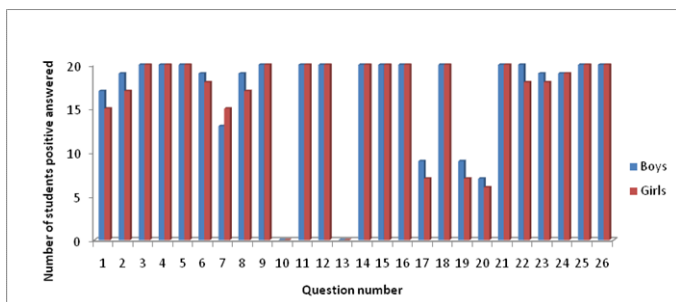


Figure 2. Positive answered by urban boys and girls

Table 4. Correlation table for urban boys and girls

	Boys	Girls
Boys	1	
Girls	0.98781201	1

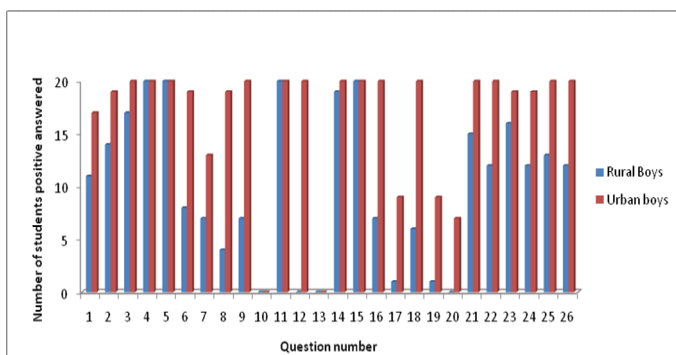


Figure 3. Positive answered by rural boys and urban boys

Tanle 5. Correlation table for rural boys and urban boys

	Rural Boys	Urban boys
Rural Boys	1	
Urban boys	0.676374197	1

education than urban students. Rural areas students not use ICT instruments than urban areas students. Urban areas students are more advance to use ICT instruments on learning mathematics.

Limitations of the study

In lockdown situation there have many fault in this research among them some are discussed below.

- 1) The test used by the researcher for the collection of data was not standardized but only developed by him.
- 2) In a very short period of time, the researcher was unable to visit different districts for collection of data.
- 3) For the quantitative data analysis the researcher only statistics table but it would be better if he followed others statistics such as mean, median, mode, quartile, percentile, skewness and kurtosis for getting more specific results.
- 4) There have no justification about teacher interest on ICT based Mathematics education.

CONCLUSION

In this modern time period ICT play important role to teaching learning method . Mathematics education through ICT based is an interesting learning at present time. Through ICT based Mathematics learning students learn bitterly then other types of learning process. But at present time the rural areas students are less developed then urban areas students. Urban students are more developed to use ICT for learning mathematics then rural. Also there is no longer difference between girls and boys students to learn mathematics on ICT based Education. The government provides sufficient support on the basis of ICT based learning. But in rural areas government has to be taken more care to develop ICT based Mathematics education in globalization period ICT play important role for education for learning mathematics through ICT based.

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