

Gender Comparison of Attitude of Secondary School Students Towards Mathematics.

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ABSTRACT:- Success In Mathematics Depends Upon Their Attitude Towards Mathematics. This Study Is Based On Survey Of Secondary School Students About Their Attitude Towards Mathematics. Students Of Both Genders Constitute The Population Of This Study. Sample Of The Study Comprises Of 300 Students (Male=150 And Female=150) From 10 Government And 10 Private Schools In Tinsukia District Of Assam. The Study Revealed That 46.4 Percent Of The Male Students And 30 Percent Of Female Students Have Extremely Favorable Attitude Towards Mathematics. Further, The Study Demonstrates That There Is A Significant Difference In The Attitudes Towards Mathematics Of Male And Female Students Of Private Schools. The Same Was Found In Case Of Male And Female Students Of Urban Schools As Well With Regard To Their Total Mean Attitude Score Towards Mathematics .On The Other Hand, No Such Difference Was Evident On Gender Basis In Case Of Rural, English And Vernacular Medium Schools As Such.

Key Words: *Mathematics, Attitude, Gender, School Type*

I. INTRODUCTION

Mathematics Has Always Been A Matter Of Revulsion Amongst Students. Since Ages, Its Intricacy Has Petrified The Hearts Of Many While Kindled The Hearts Of A Few. While Some Went On To Create History, Others Were Trowned By The Fear Of Failure And Disgrace. And What Has Stood As The Indelible And Significant Factor Behind This Revulsion Is The Pessimistic Attitude Of The Masses Towards The Subject Since Ages. Attitude Towards Mathematics Plays A Crucial Role In The Teaching And Learning Process Of Mathematics. It Effects Student's Achievement In Mathematics. The Teaching Method, The Support Of The Structure Of The School, The Family And Student's Attitude Towards School Affects The Attitude Towards Mathematics. Affective Variable Such As Attitude Towards Mathematics Is Related To The Learning Of Mathematics And To The Learning Environment In A Classroom (Reyes, 1984). Current Reform Efforts In Mathematical Education Call For Students To Be Active Participants In The Learning Process And For Solving Non Routine Problems. While Researches Have Pointed Out That This Type Of Environment Supports Student Construction Of Knowledge And Organization Of Their Thoughts, These Changes May Conflict With Students' Attitude Towards Mathematics (Wheatley Abshire, 2002). However, This Type Of Reform Should Improve Student's Interest And Enjoyment Of Studying Mathematics (Mcleod, 1994). Therefore, To Improve The Learning Of Mathematics, It Is Important To Study Students' Attitudes Towards Mathematics (Fennema & Sherman, 1976; Reyes 1984). Children Begin To Develop An Attitude Towards Mathematics As Soon As They Are Exposed To Mathematics; These Attitudes Can Have An Effort On Students Learning Of Mathematics. Attitude Is A State Of An Individual's Mind That Has Resulted Through Experience And Directs How That Individual Should Respond To An Object Or Situation That Is Related To Or Associated With It (Allport, 1935). The Objects Or Situations In All The Above Definitions May Be Mathematics Itself, Solving Mathematical Problems, Understanding Concept In Mathematics .Usefulness Of Mathematics Or Motivation For Learning Mathematics. Thus We Shall Define Attitude Towards Mathematics As A Deposition Towards An Aspect Of Mathematics That Has Been Acquired By An Individual Through His Or Her Beliefs And Experiences But Which Could Be Changed.

II. NEED OF THE STUDY

The Modern World Of Technology Is Full Of Competition. In This Present Era Much Emphasis Is Laid On Achievement Of Students In Their Academic And Related Activities. The Report Of The Indian Education Commission (1964-66) Recommended That "Science And Mathematics Should Be Taught On A Compulsion To All Pupils As A Part Of General Education During The First Ten Years Of Schooling."

It Is A General Belief That Amongst All Subjects At School, Mathematics Is The Most Difficult And Most Feared Subject, Especially By Females .While Reviewing The Related Literature It Has Been Observed That Different Individual Exhibited Varying Attitude Towards Mathematics That Affect Their Ability To Learn And Triumph In The Subject. Gender Has Been One Of The Major Factors Perceived To Be Influential Towards The Performance Of Students In Mathematics, Perhaps, The Reason Why Males Are Pursuing Mathematics Related Disciplines And Professions In Greater Proportions Than Females. All Professions Requiring Higher Level Knowledge Of Mathematics Are Dominated By Male Community. It Is In Addition Needless To Mention That There Are Several Barriers For The Female Students To Have Their Career In Mathematics. Even If A Handful Try Their Hands On The Subject, Their Parents Consider It As A Useless Effort And A Mere Waste Of Time And Money.Sometimes Female Students' Show Less Confidence In Mathematics Than Their Male Counterparts. Their Attributions Of Failure And Success Also Differ (Leder, 1984; Subotnik,1988;Cohen And Kosler, 1991; Hanson,1992; Dickens And Cornell,1993).The Studies Also Reported That Poor Mathematical Skills In Women Deprive Them From A Large Number Of Professions Because In Some Specific Jobs Knowledge Of Mathematics Is The Pre-Requisite At The Entry Level.

While Going Through The Literature It Is Found That In India And Abroad, A Number Of Studies Have Been Undertaken On 'Pupils Achievement In Mathematics' But In The North East Number Of Such Studies Are Very Few. No Work Has Yet Been Undertaken On The Gender Comparison Of Attitude Of Secondary School Students Towards Mathematics In Tinsukia District Of Assam. Therefore The Present Investigator Being A Teacher Of Mathematics In A Secondary School Of Tinsukia District Has Made An Attempt Expecting That The Result Of The Study Would Have Its Far Reaching Implications On Both Teachers And Students At The Secondary Level.

III. OBJECTIVES OF THE STUDY

- To Find Out The Extent To Which The Male And Female Students Show Favorable Attitude Towards Mathematics.
- To Find Out If There Is Any Difference Between The Mean Score Of Attitude Of Male And Female Secondary School Students Towards Mathematics With Respect To
 - i. Private Schools V. English Medium Schools
 - ii. Government Schools Vi. Vernacular Medium Schools
 - iii. Rural Schools
 - iv. Urban School

IV. METHODOLOGY

Simple Survey Method Was Used In This Study. In Order To Achieve The Above-Cited Objective, The Various Aspect Of The Methodology Followed Were: Sample, Tools, Procedure Of Data Collection And Statistical Techniques, Scoring Procedure.

A) Population And Sample

All The Students Of Ix And X Standards Studying In Different Secondary Schools Of Tinsukia District Of Assam Constitute The Population Of The Study.

A Sample Consisting Of 300 Students Belonging To Different Communities Which Includes Males, Females; Rural-Urban; Studying In English Medium And Vernacular Medium Schools Were Selected On Stratified Random Sampling Basis From 20 Schools I.E. 10 Government Provincial And 10 Private Schools Spreaded In And Around The Tinsukia District Of Assam. Distribution Of Sample Is Furnished In The Following Table No. 1.

Table 1 :Distribution Of The Sample :

Distribution Of Schools				Distribution Of Respondents (Students)					
Govt.-10		Private-10		Type Of Schools		School Environment		Medium Of Instruction	
Urban	Rural	Urban	Rural	Private	Govt. Prov.	Urban	Rural	English Medium	Vernacular Medium
6	4	7	3	150	150	160	140	125	175

B) Tools Used

Mathematics Attitude Scale (Mas) Developed By Dr Ali Iman (Lucknow) And Dr Tahira Katoon (Aligarh) Published By The National Psychological Corporation Was Adopted By The Investigator For Collecting Data Required For The Present Study. The Scale Consists Of 22 Items Designed To Measure The

Attitude Of Students Towards Mathematics. The Scale Contains 11 Positive Items And 11 Negative Items. The Mas Consists Of Three Areas As Usefulness Of Mathematics (3,7,8,10,12,13,15,16,17,18,20), Confidence Of Learning Mathematics (1,2,5,6,14,21,22) And Enjoyment Of Mathematics(4,9,11,19)

C) Procedure Of Data Collection

After Selecting The 300 Students Of Selected Schools, The Investigator Approached Them Individually And Requested Them To Fill Up The Mathematics Attitude Scale (Mas). Though The Tool Was Self Administering, The Investigator Explained The Students How To Fill The Tool. After The Collecting The Filled In Tool, It Was Scored And Tabulated Systematically For Statistical Calculation.

D) Statistical Techniques Used

The Investigator Used The Statistical Techniques Like Mean, Z-Score, Standard Deviation, C.R. Etc For Analyzing And Interpretation Of The Data Collected For The Study.

E) Scoring Procedure

The Scoring Was Done By Using The Scoring Key Which Provides The Weightage For The Items. The Mas Is A 5 Point Rating Scale Consisting Of 22 Items Distributed Over Alternate Responses Like Strongly Agree, Agree, Undecided, Disagree And Strongly Disagree. The Positive Items Of The Scale Were Assigned A Weight Ranging From 5 (Strongly Agree) To 1 (Strongly Disagree) And In Case Of Negative Items, The Scoring Is Reverse Ranging From 1 (Strongly Agree) To 5 (Strongly Disagree). The Different Areas Of Mas Were Scored Separately. The Total Score Is The Summation Of The Score Of All In Areas.

5. Analysis And Interpretation

To Find Out The Extent To Which The Students Have Favorable Attitude Towards Mathematics, The Investigator Converted The Raw Scores Into Corresponding Z- Scores From The Table Which Was Provided In The Mas For The Interpretation Of Data. There After The Number Of Students Falling In Each Grade And Their Grade-Wise Percentages Were Calculated And The Calculated Values Are Represented In The Following Table No.2

Table 2 :Level Of Attitude Of The Male And Female Students Towards Mathematics :

Variable	Extremely Favorable		Highly Favorable		Above Average Favorable		Average/ Moderate Favorable		Below Average Favorable		Highly Unfavorable		Extremely Unfavorable	
	N	Perce	N	Perce	N	Perce	N	Perce	N	Perce	N	Perce	N	Perce
Male Students	70	46.6	45	30	20	13.4	15	10	-	-	-	-	-	-
Female Students	45	30	45	30	30	20	30	20	-	-	-	-	-	-
Total	115	38.3	90	30	50	16.6	45	15	-	-	-	-	-	-

It Is Evident From The Above Table That 46.4 Percent Of Male Students Have Extremely Favorable, 30 Percent Of Them Have Highly Favorable, 13.4 Percent Of Them Have Above Average Favorable And 10 Percent Have Average Favorable Attitude Respectively Towards Mathematics. Among The Female Students 30 Percent Have Extremely Favorable, 30 Percent Have Highly Favorable, 13.4 Percent Have Above Average Favorable And 10 Percent Have Average Favorable Attitude Respectively Towards Mathematics. It Is Also Observed From The Above Table That Out Of 300 Students 38.33 Percent Students Have Extremely Favorable, 30 Percent Students Have Highly Favorable, 16.66 Percent Students Have Above Average Favorable And 15 Percent Students Have Average Favorable Attitude Towards Mathematics.

Table : 3 Comparison Of Mean Score Of Different Sub-Groups Of Students – Standard Ix And X Of Tinsukia District With Regard To Their Attitude Towards Mathematics.

Sub Group	S e x	Areas	Total
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Type Of Schools		Confidence About Mathematics			Usefulness Of Mathematics			Enjoyment Of Mathematics					
Private	M	28.27	5.35	1.94	47.26	3.63	11.34	18.44	6.39	1.69	93.9	9.74	5.39*
	F	29.26	3.18		41.7	4.18		17.23	5.89		88.2	8.8	
Government Provincial	M	27.81	4.57	6.78*	44.13	5.18	1.69	18.96	5.57	4.30*	91	7.79	1.20
	F	31.54	4.93		43.13	5.33		15.82	6.90		89.7	9.88	
Location													
Rural	M	28.36	5.39	1.73	44.16	5.47	1.09	17.36	5.42	1.22	91.0	9.49	1.17
	F	29.4	3.64		43.46	5.46		15.4	7.15		89.8	8.17	
Urban	M	27.26	4.36	1.32	48.23	4.41	5.1	19.1	6.35	.98	92.6	9.62	2.19*
	F	28.25	4.39		46.25	3.94		18.2	4.98		89.1	8.85	
Medium Of Instruction													
English	M	28.27	4.15	1.21	47.12	4.95	1.29	18.16	4.56	.90	95.8	9.13	1.68
	F	29.15	4.08		48.23	4.64		19.02	6.03		96.4	9.56	
Vernacular	M	27.9	4.16	1.80	46.98	4.11	0.63	19.2	4.43	1.38	94.0	9.03	1.34
	F	26.8	3.98		47.12	4.25		18.3	4.12		92.2	9.17	

- Significant At 0.05 Level.

The Data Analyzed In The Above Table May Be Interpreted In Different Subgroups Wise In The Following Manner :-

Type Of Schools:-

It Is Clear From The Above Table That Male And Female Students Of Private Schools Do Not Differ Significantly In Terms Of Their Enjoyment In Doing Mathematical Sums As Well As, Confidence In Mathematics, But There Is Significant Difference In Terms Of Their Attitude Towards Usefulness Of Mathematics Since C.R Value Is 11.34. The Cr Value Of 5.39 Indicates That There Is A Significant Difference Between Male And Female Of Private School Students With Regard To Their Total Mean Attitude Score Towards Mathematics. The Mean Score Of Male Students Is Higher Than The Female Students. On The Other Hand It Is Clear From The Above Table That Male And Female Students Of Government Provincial Schools Differ Significantly In Terms Of Their Enjoyment In Doing Mathematical Sums As Well As, Confidence In Mathematics, But There Is No Significant Difference In Terms Of Their Attitude Towards Usefulness Of Mathematics Since C.R Value Is 1.69. The Cr Value Of 1.20 Indicates That There Is No Significant Difference Between Male And Female Of Government Provincial School Students With Regard To Their Total Mean Attitude Score Towards Mathematics .In This Case Also The Mean Score Of Male Students Is Higher Than The Female Students

Location:-

It Is Evident From The Above Table No 3 That Male And Female Students Studying In Urban Schools Differ Significantly With Respect To Their Attitude Towards Usefulness In Mathematics Since C R Value Is 5.1 Whereas, There Is No Significant Difference Existing Between Them In Terms Of Their Attitude Towards Confidence And Enjoyment In Doing Of Mathematics As The C R Values Are 1.32 And .98 Respectively. The Table Also Indicates That There Is A Significant Difference Between Male And Female Students Studying In Urban Schools In Terms Of Their Total Mean Attitude Score As The C.R Value Is 2.19 It Is Also Observed From The Table No-3 That The C R Values Of 1.73, 1.09 And 1.22 Respectively Indicates That The Male And Female Students Of Rural Schools Do Not Differ Significantly In Terms Of Their Confidence, Usefulness And Enjoyment In Doing Different Mathematical Sums. The C. R. Value Of 1.17 Indicates That There Is No Significant Difference Between Male And Female Students Of Rural Schools In Terms Of Their Total Mean Attitude Scores.

Medium Of Instruction:-

It Is Observed From The Table No-3 That The C R Values Of 1.21, 1.29 And .90 Respectively Indicates That Male And Female Students Of English Medium Schools Do Not Differ Significantly In Terms Of Their Confidence In Mathematics, Attitude Towards Usefulness And Also Enjoyment In Doing Different Mathematical Sums. On The Other Hand, C. R. Value Of 1.68 Indicates That There Is No Significant Difference Between Male And Female Students Of English Medium Schools In Terms Of Their Total Mean Attitude Scores. Similarly It Was Also Found That The C R Values Of 1.80, 0.63 And 1.38 Respectively Indicates That Male And Female Students Of Vernacular Medium Schools Do Not Differ Significantly In Terms Of Their Confidence In Mathematics, Attitude Towards Usefulness Of Mathematics And Also Enjoyment In Doing Different Mathematical Sums. The C.R Value 1.34 Indicates That There Is No Significant Difference Between Male And Female Students Of Vernacular Medium Schools In Terms Of Their Total Mean Attitude Scores.

V. MAJOR FINDINGS OF THE STUDY

The Major Findings Of The Study Are As Follows:

1. 46.4 Percent Of The Male Students Have Extremely Favorable Attitude Towards Mathematics Whereas In Case Of Female Students It Is Only 30 Percent.
2. There Is No Significant Difference Between Male And Female Students Of Private School With Regard To Their Confidence In Mathematics And Enjoyment In Doing Different Mathematical Sums. But There Is A Significant Difference With Regard To Their Opinion About Usefulness Of Mathematics.
3. There Is No Significant Difference Between Male And Female Students Of Govt. Provincial School With Regard To Their Mean Attitude Scores And It Is Evident From A Lower C.R. Value Of 1.20.
4. There Is A Significant Difference Between Male And Female Students Studying In Urban Schools With Regard To Their Confidence In Mathematics Since The C.R. Value Is 6.78.
5. However, The Study Indicates That There Is No Significant Difference Between Male And Female Students Of Rural Schools With Regard To Their Attitude Towards Mathematics As A Whole .
6. There Is No Significant Difference Between Male And Female Students Studying In English Medium Schools With Regard To Their Confidence In Mathematics, Opinion Toward Usefulness Of Mathematics And Last But Not The Least, Enjoyment In Doing Different Mathematical Sums. The Same Results Is Found In The Case Of Government Schools Also.

VI. DISCUSSION AND CONCLUSION

In The Present Study The Investigator Sought To Compare The Attitude Of Male And Female Students Of Standard Ix And X Of Tinsukia District Of Assam Towards Mathematics. It Is Observed From The Result Of The Study That 46.6 Percent Boys Have Extremely Favorable Attitude Towards Mathematics Than Those Of Girls As It Is Indicated By 30 Percent Only. The Reason Behind Such Findings May Be Attributed To The Fact That Girls Are Often Found To Be Discouraged In Doing Mathematical Work In Their Primary Years And This Has Its Subsequent Affect At Their Secondary Level Too As They Do Not Enjoy Doing Mathematics Like Those Of Boys. These Findings Have Been Corroborated By The Findings Of Willis (1995); Fullarton (1993) Since Their Studies Also Reported That "Poor Attitude Towards Mathematics Has Often Been Cited As One Factor That Has Contributed To Lower Participation And Success Of Girls In Mathematics." It Has Been Further Corroborated By The Findings Of Ahmed And Bora (2011) Who In Their Study On Secondary Schools Of Karbi Anglong District Of Assam, Also Reported That There Exist A Significant Difference Between The Mathematics Achievement Of Male And Female Students.

The Data In The Aforesaid Table Further Indicates That There Is A Significant Difference Between Male And Female Students Of Urban Areas In Terms Of Their Enjoyment In Doing Different Mathematical Sums. The Possible Reasons Behind This Could Be The Lack Of Confidence Amongst Girls And Their

Pessimistic View Of The Subject, The Unenthusiastic Approach Of The Parents, The Problems Relating To Their Security And Liberty And The Like. On The Other Hand There Is No Significant Difference In Their Attitude Can Be Spotted Amongst The Boys And Girls Studying To The Fact That Both The Former And Latter Shared More And Less The Same Results In Various Spheres Of Their Attitude.

So Far As The Medium Of Instruction Is Concerned The Present Study Reported That There Is No Significant Difference Between Male And Female Students Studying In English Medium School As They May Be Shared Nearly The Same Attitude In Different Areas Towards The Attitude Of Mathematics. A Similar Result Was Found With Respect To Male And Female Students Of Vernacular Medium Of Schools. Therefore Language Do Not Affect Students Attitude Towards Mathematics. The Study Further Implies That Female Students Should Be Encouraged And Motivated Towards Learning Mathematics Through Innovative Techniques Of Teaching. Both Parents And Teachers Should Sincerely Try To Identify Their Weaknesses If Any In Learning Mathematics And Give Subsequent Remedy In This Regard. Concerned Teachers Should Be Trained In Developing Positive Attitude Among Students In Learning Mathematics.

Last But Not The Least It May Be Concluded By Stating That Rural Students Should Be Facilitated With Innovative Techniques And Strategies Of Learning Mathematics So As To Motivate And Encourage Them To Take Interest In Mathematics. Teachers Teaching Mathematics In Rural Schools Should Get Avenues To Update Their Skills And Knowledge From Time To Time Through Various Training Or Orientation Camps. Further As A Matter Of Concern It May Be Noted That In Several Training Sessions In The State, The Master Trainers Who Provide Training To The Teachers Themselves Lack Appropriate Professional Degrees And Qualifications As Well As Adequate Knowledge About Methods And Techniques For Creative Teaching As An Aftermath Of Which The Training Imparted In Most Cases Does Not Yield Effective Results Or Play Any Significant Role In Improving The Situations. Therefore Conclude In A Nutshell, Both Parents And Teachers On The Whole Should Take Sincere Efforts In Developing Positive Attitude Amongst Students Towards Learning Mathematics. The Authorities And Policy Makers Should Take Necessary Steps In Formulating Proficient Curriculum, Syllabus, Text Books Of Mathematics Considering The Age Of The Students, Their Grade, Level Of Interest, Capability Etc. It Is Only Then That The Students Will Be Able To Develop Optimistic Attitude Towards Learning Mathematics Irrespective Of Their Gender And Background And This Will Flourish In Them The Craving To Learn And Comprehend Better And Seek New Horizons.

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