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APPENDICES

APPENDIX I

ETHICAL COMMITTEE

INSTITUTIONAL HUMAN ETHICS COMMITTEE

Avinashilingam

Institute for Home Science and Higher Education for Women

Deemed to be University Under category 'A' By MHRD, (Estd. u/s 3 of UGC Act 1956)
Re Accredited with 'A' Grade By NAAC, Recognised by UGC Under Section 12 B
Coimbatore - 641043, Tamil Nadu, India

Seek and Ye Shall Find

Chairman
Dr. S. Ramalingam
Principal, PSG Institute
of Medical Sciences
& Research, Coimbatore

Member Secretary
Dr.S.Uma Mageshwari
Professor,
Dean Student Affairs,
Department of Food Service
Management & Dietetics

Members
Dr.P.R.Padma
Mr. K.Arulmoli (Legal Expert)
Dr. N.S. Rohini
Dr.Subhashini K. Sripathi
Dr.A. Saraswathy
Ms.D.Kavitha
Dr.S. Muthulakshmi
Dr.G.Victoria Naomi
Dr. Judith Justin
Dr.Anitha Subash

24 January 2019

To
Ms. Yogeshwari.S
Department of Education
Avinashilingam Institute for Home Science and
Higher Education for Women
Coimbatore – 641 043

Dear Yogeshwari.S,

Ref: Your proposal No. IHEC/18-19/EDU/02 entitled "Effectiveness of Vedic Mathematics on Problem Solving Ability and Attitude towards Mathematics Learning Among High School Students" submitted for approval to the IHEC on 30.09.18.

The Institutional Human Ethics Committee of our University hereby grants approval to your research proposal No. IHEC/18-19/EDU/02 entitled "Effectiveness of Vedic Mathematics on Problem Solving Ability and Attitude towards Mathematics Learning Among High School Students" submitted by you. The Approval number for the same is AUW/ IHEC/EDU-18-19/XPD/01.

We wish you all the best in your research endeavours.

Regards,

Dr.S.Uma Mageshwari
Member Secretary

Institutional Human Ethics Committee

APPENDIX II

CEO Consent Letter

நீலகிரி மாவட்ட முதன்மைக் கல்வி அலுவலரது செயல்முறைகள், உதகமண்டலம்.
பிறப்பிப்பவர் : திரு அ. நாசருதீன் எம்.எஸ்.ஸி., எம்.எட்.,

ந.க.எண். 6222/இ3/2018 நாள்.14.11.2018

பொருள்: கல்வி – வேத கணிதம் பயன்பாடு – உயர்நிலைப் பள்ளிகளில் 8ஆம் வகுப்பு மாணவர்களிடையே – பயிற்சி – கோவை அவினாசிலிங்கம் கல்வியியல் பல்கலைகழகத்தில் பயிலும் மாணவ/மாணவியர்கள் அரசு / அரசு உதவிபெறும் உயர்/மேல்நிலைப் பள்ளிகளில் கற்பித்தல் பயிற்சிக்கு அனுமதி அளித்தல் – சார்பு.

பார்வை: முதல்வர், கோவை அவினாசிலிங்கம் கல்வியியல் பல்கலைகழகம் கடிதம் நாள். 28.09.2018.

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பார்வையில் காணும் கோவை அவினாசிலிங்கம் கல்வியியல் பல்கலைகழகம், முதல்வரின் கடிதத்தில் கோரியுள்ளபடி கீழ்க்காணும் மாணவிக்கு கீழ்க்கண்ட நிபந்தனைகளின் அடிப்படையில் கீழ்கண்ட ஒவ்வொரு பள்ளிகளிலும் பதினைந்து பாடவேளை வீதம் வேத கணித பயன்பாடு மாணவ/மாணவிகளுக்கு கற்பித்தல் பயிற்சி பெற அனுமதி வழங்கப்படுகிறது.

வ. எண்	மாணவ/மாணவியர் பெயர்	பாடம்	பி.எச்.டி ஆய்விற்காக அனுமதி வழங்கும் பள்ளி
1	எஸ். யோகேஷ்வரி	வேத கணிதம்	மார்னிங் ஸ்டார் மேல்நிலைப் பள்ளி, கூடலூர்.
			புனித மரியன்னை உயர்நிலைப் பள்ளி, மேல்கூடலூர்.
			அரசு மேல்நிலைப் பள்ளி, ஸ்ரீமதுரை.
			புனித செபாஸ்டியன் மெட்ரிக் உயர்நிலைப் பள்ளி, மஞ்சுவயல்

நிபந்தனைகள்.

1. பள்ளி மாணவர்களுக்கு எவ்வித குந்தகமும் ஏற்படாமல் பயிற்சி மேற்கொள்ள வேண்டும்.
2. மாணவர்களின் கல்வி தரம் எந்த விதத்திலும் பாதிக்கக்கூடாது.

14.11.18

முதன்மைக் கல்வி அலுவலர்,
நீலகிரி, உதகமண்டலம்.

22/11/18

பெறுநர்–சம்பந்தப்பட்ட மாணவி.
நகல்– சம்பந்தப்பட்ட பள்ளித் தலைமை ஆசிரியர்கள்.
நகல்– சம்பந்தப்பட்டக் கல்லூரி முதல்வர்.

APPENDIX III

ITEM ANALYSIS OF DRAFT TOOLS

Item analysis of Achievement test on mathematics for eighth and third grade, Attitude scale in mathematics for eighth and third grade, and learning style inventory for eighth and third grade.

a. Item Analysis for the Previous Knowledge Achievement Test in Mathematics for VIII grade

(DI between 0.3 and 0.8/ DP ≥ 0.4 is accepted)

Item No.	DI	DP	Remarks
1	0.70	0.44	Accepted
2	0.65	0.33	Rejected
3	0.48	0.44	Accepted
4	0.54	0.56	Accepted
5	0.54	0.04	Rejected
6	0.70	0.30	Rejected
7	0.59	0.59	Accepted
8	0.43	0.11	Rejected
9	0.65	0.48	Accepted
10	0.56	0.44	Accepted
11	0.43	0.41	Accepted
12	0.50	0.48	Accepted
13	0.52	0.59	Accepted
14	0.50	0.48	Accepted
15	0.54	0.56	Accepted
16	0.65	0.33	Rejected
17	0.50	0.70	Accepted
18	0.54	0.41	Accepted
19	0.56	0.52	Accepted
20	0.54	0.63	Accepted
21	0.57	0.48	Accepted
22	0.69	0.41	Accepted
23	0.52	0.30	Rejected
24	0.54	0.56	Accepted

Item No	DI	DP	Remarks
25	0.56	0.44	Accepted
26	0.41	0.44	Accepted
27	0.46	0.63	Accepted
28	0.56	0.44	Accepted
29	0.59	0.37	Rejected
30	0.65	0.26	Rejected
31	0.61	0.41	Accepted
32	0.41	0.44	Accepted
33	0.57	0.56	Accepted
34	0.54	0.63	Accepted
35	0.50	0.41	Accepted
36	0.76	0.26	Rejected
37	0.80	0.33	Rejected
38	0.67	0.30	Rejected
39	0.63	0.52	Accepted
40	0.54	0.56	Accepted
41	0.57	0.56	Accepted
42	0.65	0.26	Rejected

b. Item Analysis for the Achievement Test in Mathematics for VIII grade

(DI between 0.3 and 0.8/ DP ≥ 0.4 is accepted)

Item No.	DI	DP	Remarks
1	0.59	0.59	Accepted
2	0.52	0.52	Accepted
3	0.43	0.78	Accepted
4	0.59	0.07	Rejected
5	0.50	0.41	Accepted
6	0.56	0.81	Accepted
7	0.50	0.41	Accepted
8	0.54	0.78	Accepted
9	0.50	0.56	Accepted
10	0.44	0.52	Accepted
11	0.61	0.63	Accepted
12	0.52	0.67	Accepted
13	0.48	0.59	Accepted
14	0.59	0.44	Accepted
15	0.44	0.52	Accepted
16	0.43	0.48	Accepted
17	0.46	0.56	Accepted
18	0.48	0.81	Accepted
19	0.54	0.56	Accepted
20	0.46	0.56	Accepted
21	0.48	0.81	Accepted
22	0.52	0.37	Rejected
23	0.44	0.67	Accepted
24	0.44	0.52	Accepted
25	0.44	0.44	Accepted
26	0.44	0.67	Accepted
27	0.33	0.44	Rejected
28	0.57	0.33	Rejected
29	0.48	0.37	Rejected
30	0.63	0.15	Rejected
31	0.48	0.67	Accepted
32	0.48	0.59	Accepted
33	0.61	0.63	Accepted
34	0.48	0.44	Accepted
35	0.56	0.52	Accepted
36	0.74	0.22	Rejected
37	0.56	0.22	Rejected
38	0.43	0.11	Rejected
39	0.67	0.52	Accepted
40	0.41	0.52	Accepted
41	0.52	0.81	Accepted
42	0.46	0.56	Accepted
43	0.50	0.41	Accepted
44	0.54	0.63	Accepted
45	0.26	-0.07	Rejected
46	0.43	-0.19	Rejected
47	0.37	0.07	Rejected

c. Item Analysis for the Attitude towards Mathematics for VIII grade

(t value greater than 1.96 is accepted)

Item No.	*t*	sig	Remarks
1	2.341	0.023	Accepted
2	3.513	0.001	Accepted
3	2.937	0.005	Accepted
4	3.865	0.000	Accepted
5	3.225	0.002	Accepted
6	3.381	0.001	Accepted
7	4.629	0.000	Accepted
8	3.521	0.001	Accepted
9	1.383	0.173	Rejected
10	0.806	0.424	Rejected
11	3.947	0.000	Accepted
12	3.277	0.002	Accepted
13	3.812	0.000	Accepted
14	4.505	0.000	Accepted
15	2.701	0.009	Accepted
16	4.542	0.000	Accepted
17	3.404	0.001	Accepted
18	2.539	0.014	Accepted
19	2.235	0.030	Accepted
20	3.034	0.004	Accepted
21	3.453	0.001	Accepted
22	3.257	0.002	Accepted
23	7.240	0.000	Accepted
24	2.750	0.008	Accepted
25	3.607	0.001	Accepted
26	4.514	0.000	Accepted
27	4.448	0.000	Accepted
28	5.304	0.000	Accepted
29	3.362	0.001	Accepted
30	2.064	0.044	Accepted
31	3.329	0.002	Accepted
32	3.602	0.001	Accepted
33	2.161	0.035	Accepted
34	3.225	0.002	Accepted
35	3.799	0.000	Accepted
36	3.381	0.001	Accepted
37	4.629	0.000	Accepted
38	1.160	0.251	Rejected
39	3.380	0.001	Accepted
40	4.404	0.000	Accepted
41	2.539	0.014	Accepted
42	2.628	0.011	Accepted

d. Item Analysis for the Previous Knowledge Achievement Test in Mathematics for III grade

(DI between 0.3 and 0.8/ DP ≥ 0.4 is accepted)

Item No.	DI	DP	Remarks
1	0.83	0.19	Rejected
2	0.67	0.30	Rejected
3	0.46	0.26	Rejected
4	0.72	0.26	Rejected
5	0.67	0.22	Rejected
6	0.61	0.56	Accepted
7	0.57	0.41	Accepted
8	0.41	0.30	Rejected
9	0.59	0.37	Rejected
10	0.61	0.41	Accepted
11	0.50	0.26	Rejected
12	0.56	0.52	Accepted
13	0.44	0.59	Accepted
14	0.48	0.22	Rejected
15	0.44	0.67	Accepted
16	0.78	0.30	Rejected
17	0.69	0.48	Accepted
18	0.61	0.48	Accepted
19	0.78	0.44	Accepted
20	0.61	0.48	Accepted
21	0.61	0.63	Accepted
22	0.33	0.30	Rejected
23	0.31	0.48	Accepted
24	0.59	0.52	Accepted
25	0.54	0.41	Accepted
26	0.48	0.59	Accepted
27	0.50	0.56	Accepted
28	0.59	0.52	Accepted
29	0.44	0.74	Accepted
30	0.52	0.30	Rejected

31	0.70	0.52	Accepted
32	0.50	0.11	Rejected
33	0.56	0.59	Accepted
34	0.56	0.37	Rejected
35	0.63	0.37	Rejected

e. Item Analysis for the Achievement Test in Mathematics for III grade

(DI between 0.3 and 0.8/ DP ≥ 0.4 is accepted)

Item No.	DI	DP	Remarks
1	0.70	0.44	Accepted
2	0.50	0.33	Rejected
3	0.57	0.19	Rejected
4	0.54	0.41	Accepted
5	0.65	0.56	Accepted
6	0.61	0.41	Accepted
7	0.61	0.19	Rejected
8	0.70	0.37	Rejected
9	0.44	0.22	Rejected
10	0.54	0.41	Accepted
11	0.61	0.26	Rejected
12	0.57	0.26	Rejected
13	0.59	0.37	Rejected
14	0.56	0.44	Accepted
15	0.69	0.56	Accepted
16	0.63	0.44	Accepted
17	0.65	0.70	Accepted
18	0.44	0.44	Accepted
19	0.56	0.52	Accepted
20	0.54	0.41	Accepted
21	0.44	0.44	Accepted
22	0.70	0.44	Accepted
23	0.57	0.11	Rejected
24	0.61	0.11	Rejected
25	0.52	0.52	Accepted
26	0.41	0.30	Rejected
27	0.57	0.26	Rejected
28	0.57	0.48	Accepted
29	0.69	0.56	Accepted
30	0.54	0.41	Accepted
31	0.63	0.44	Accepted
32	0.63	0.59	Accepted

f. Item Analysis for the Attitude towards Mathematics for III grade

(t value greater than 1.96 is accepted)

Item No.	*t*	sig	Remarks
1	2.977	0.004	Accepted
2	3.099	0.003	Accepted
3	3.219	0.032	Accepted
4	2.984	0.004	Accepted
5	3.814	0.000	Accepted
6	1.803	0.077	Rejected
7	1.702	0.095	Rejected
8	0.912	0.366	Rejected
9	7.124	0.000	Accepted
10	1.521	0.134	Rejected
11	1.198	0.236	Rejected
12	1.901	0.063	Rejected
13	2.064	0.044	Accepted
14	4.138	0.000	Accepted
15	2.368	0.022	Accepted
16	1.722	0.091	Rejected
17	3.540	0.001	Accepted
18	1.780	0.081	Rejected
19	0.956	0.343	Rejected
20	5.395	0.000	Accepted
21	1.383	0.173	Rejected
22	1.160	0.251	Rejected
23	0.407	0.686	Rejected
24	5.514	0..000	Accepted
25	0.095	0.924	Rejected
26	1.755	0.085	Rejected
27	3.163	0.003	Accepted
28	1.521	0.134	Rejected
29	2.983	0.001	Accepted
30	3.041	0.004	Accepted
31	3.486	0.001	Accepted
32	3.247	0.001	Accepted
33	2.950	0.005	Accepted
34	6.987	0.000	Accepted
35	0.851	0.399	Rejected
36	3.007	0.004	Accepted

g. Item Analysis for Learning Style Inventory

(t value greater than 1.96 is accepted)

Item No.	*t*	sig	Remarks
1	3.540	0.001	Accepted
2	3.187	0.002	Accepted
3	4.137	0.000	Accepted
4	2.938	0.005	Accepted
5	3.379	0.001	Accepted
6	0.539	0.592	Rejected
7	0.267	0.790	Rejected
8	4.579	0.000	Accepted
9	4.070	0.000	Accepted
10	3.540	0.001	Accepted
11	0.612	0.543	Rejected
12	3.146	0.003	Accepted
13	5.266	0.000	Accepted
14	0.587	0.560	Rejected
15	1.809	0.076	Rejected
16	2.361	0.022	Accepted
17	2.874	0.006	Accepted
18	1.804	0.077	Rejected
19	1.901	0.063	Rejected
20	4.137	0.000	Accepted
21	2.368	0.022	Accepted
22	0.536	0.594	Rejected
23	3.562	0.001	Accepted
24	7.044	0..000	Accepted
25	0.869	0.389	Rejected
26	1.749	0.086	Rejected
27	1.395	0.169	Rejected
28	1.780	0.081	Rejected
29	5.522	0.000	Accepted
30	5.395	0.000	Accepted
31	1.722	0.091	Rejected
32	1.359	0.180	Rejected
33	0.313	0.756	Rejected
34	3.398	0.001	Accepted
35	3.470	0.001	Accepted

Reliability

Tool	**Cronbach Alpha Coefficient**
Achievement Test in Mathematics (VIII Std.)	0.833
Attitude Test	0.907
Achievement Previous Knowledge Test	0.813
Achievement Test in Mathematics (III Std.)	0.920
Attitude Test	0.872
Achievement Previous Knowledge Test	0.894
Learning Style (VIII & III)	0.954

The value of Cronbach Alpha coefficient shows that the tool has high reliability.

APPENDIX IV A:

PREVIOUS KNOWLEDGE TEST ON MATHEMATICS

Class: VIII **Max marks**: 30

Subject: Mathematics **Time**: 1 hour 30 min

SECTION A (5X1=5)

FILL IN THE BLANKS:

1. 456-218 =…….

2. 7291÷9 =……

3. Cube root of 438976 is ……

4. Square of 95 is ……..

5. Square of 113 is …….

SECTION C (8X1=8)

CHOOSE THE BEST ANSWER:

6. 6789 ÷ 9 =…….. a) 754 b) 752 c) 751 d) 750

7. 77÷ 9 =……. . a) 7 b) 9 c) 6 d) 5

8. The square root of 1225 is … a) 46 b) 35 c) 38 d) 39

9. 17^2 = ……. a) 244 b) 256 c) 289 d) 344

10. Cube root of 830584 is … a) 94 b) 93 c) 94 d) 67

11. Square of 13 is ……. a) 145 b) 169 c) 144 d) 143

12. Square of 966 is ……. a) 99467 b) 933456 c) 933156 d) 996788

13. (2x+3y) (4x+5y) =…… a) $8x^2+22xy+15y^2$ b) $8x+22xy+15y^2$ c) $8x^2+22x+15y^2$ d)8x+22xy+15y

SECTION C (10X1=10)

MATCH THE FOLLOWING:

14. 796+95 =…….. a) 38

15. The square root of 69169 is…… b) 803

16. Square of 126 is ……. f) 263

17. 346 ÷9=……. g) 15876

18. 6426÷ 8 =…… i) $20-3x-2x^2$

19. 124 x 112 = …… j) 891

20. 776 x 999 = …… k) 775224

21. (5-2x) (4+x) =…….
22. (x +y +z) (x + y - z) is ……..
23. The cube root of 13824 is …….

l) 13888
m) 24
n) $x^2+2xy+y^2-z^2$

SECTION D (7X1=7)

WRITE TRUE OR FALSE:

24. Square of 95 is 9025

25. 89 X 98 is 8722.

26. 436-378 = 156

27. The square root of 26569 is 163.

28. The value of $(2x+3y)^2$ is $4x^2+12xy+9y^2$

29. The cube root of 438976 is 76.

30. 222 x 333 is 73927.

ANSWER KEY FOR FINAL DRAFT OF PREVIOUS KNOWLEDGE TEST- VIII GRADE

Question no	Answer	Marks
1	238	1
2	810	1
3	76	1
4	9025	1
5	12769	1
6	754	1
7	9	1
8	35	1
9	289	1
10	94	1
11	169	1
12	933156	1
13	$8x^2+22xy+15y^2$	1
14	891	1
15	263	1
16	15876	1
17	38	1
18	803	1
19	13888	1
20	775224	1
21	$20-3x-2x^2$	1
22	$x^2+2xy+y^2-z^2$	1
23	24	1
24	True	1
25	True	1
26	False	1
27	True	1
28	True	1
29	True	1
30	False	1

Appendix IV B:

An achievement test based on the sub units basic arithmetic operations, Square root, Cube roots, Algebraic multiplication, and squaring of numbers.

STEP 1: Planning of the test

Standard : VIII

Maximum marks: 35

Maximum time : I hour 30 minutes

Subject : Mathematics

Units : 1. Basic Operation

2. Number System

3. Algebra

Subunits: Addition, Subtraction, Multiplication, Division, Square root, Cube root, Algebraic multiplication and squaring of numbers.

STEP 2: Preparation of a Design

1. **Weightage to objectives**:

SI. No	objectives	Questions	Marks	%
1	Knowledge	2	2	6
2	Understanding	10	10	28
3	Application	14	14	40
4	Skill	9	9	26
	Total	35	35	100

2. **Weightage to form of questions**:

SI. No	Form of questions	Questions	Mark	%
1	Objective	35	35	100
2	Short answer	-	-	-
3	Essay	-	-	-
	Total	35	35	100

3.**Weightage to content**:

SI. No	Content(subunits)	Questions	Mark	%
1	Basic Arithmetic operation	16	16	46
2	Squaring, Square root, Cube root.	15	15	43
3	Algebraic Multiplication	4	4	11
	Total	35	35	100

4. **Weightage to difficulty level:**

SL. No	Difficulty level	Questions	Mark	%
1	Easy	14	14	40
2	Average	14	14	40
3	Difficult	7	7	20
	Total	35	35	100

5**. Scheme of sections**:

Section	Type of Questions	Number of Questions
A	Objective	35
B	Short Answer	0
C	Essay	0

BLUE PRINT

Objectives / Content	Knowledge			Understanding			Application			Skill			Total
	E	A	D	E	A	D	E	A	D	E	A	D	
Addition	1						1						2
Subtraction	1			1									2
Multiplication						1	1	2(1)		2(1)	1		7
Division							1	2(1)	2(1)				5
Square Root					1					1	1	1	4
Cube Root							1			1	2(1)		4
Algebraic Multiplication					1	2(1)		1					4
Squaring of numbers				2(1)	2(1)		1	1	1				7
Total	2			3	4	3	5	6	3	4	4	1	35
	2			10			14			9			

Number outside the bracket indicates the number of questions

Number inside the bracket indicates the mark each question carries

Achievement test on Vedic Mathematics

Class: VIII **Max marks**: 35

Subject: Mathematics **Time**: 1 hour 30 min

SECTION A (5X1=5)

FILL IN THE BLANKS:

1. 436-218 =…….

2. 6291÷9 =……

3. Cube root of 35937 is ……

4. Square of 96 is ……..

5. Square of 112 is …….

SECTION B (8X1=8)

CHOOSE THE BEST ANSWER:

6. 6782 ÷ 9 =…….. a) 754 b) 752 c) 751 d) 750

7. 78 ÷ 9 =……. . a) 9 b) 7 c) 6 d) 5

8. The square root of 2304 is … a) 46 b) 47 c) 48 d) 49

9. 7^3 = ……. a) 344 b) 345 c) 346 d) 343

10. Cube root of 110592 is … a) 48 b) 46 c) 47 d) 45.

11. Square of 12 is ……. a) 145 b) 146 c) 144 d) 143

12. Square of 999 is ……. a) 997865 b) 998001 c) 996007 d) 98765

13. (2x+3y) (4x+5y) =…… a) $8x^2+22xy+15y^2$ b) $8x+22xy+15y^2$ c) $8x^2+22x+15y^2$ d)8x+22xy+15y

SECTION C (14X1=14)

MATCH THE FOLLOWING:

14. 786+85 =……. a) 70

15. The square root of 69169 is…… b) 803

16. 6^3 =……. c) 263

17. Square of 998 is……. d) 61

18. Square of 125 is …… e) 125

19. 356 – 286 =……. f) 216

20. 6427÷ 8 =…… g) 15625

21. 432÷ 7 =……. h) 875124

22. 25 x 11 = …… i) $20-3x-2x^2$

23. 876 x 999 = …… j) 871

24. (5-2x) (4+x) =……. k) 996004

25. The square root of 15625 is…… l) 275

26. (x +y +z) (x + y - z) is …… …. m) 24

27. The cube root of 13824 is ……. n) $x^2+2xy+y^2-z^2$

SECTION D (8X1=8)

WRITE TRUE OR FALSE:

28. Square of 95 is 9025

29. 79 X 99 is 7821.

30. 436 mangoes + 378 mangoes = 763 mangoes

31. $5^3 = 135$.

32. The square root of 26569 is 163.

33. The value of $(2x+3y)^2$ is $4x^2+12xy+9y^2$

34. The cube root of 10000 is 10.

35. 286 x 302 is 86374.

ANSWER KEY FOR FINAL DRAFT OF ACHIEVEMENT TEST ON VEDIC MATHEMATICS - VIII GRADE

Question no	Answer	Marks
1	218	1
2	699	1
3	33	1
4	9216	1
5	12544	1
6	754	1
7	9	1
8	48	1
9	343	1
10	48	1
11	144	1
12	998001	1
13	$8x^2+22xy+15y^2$	1

Question no	Answer	Marks
14	871	1
15	263	1
16	216	1
17	996004	1
18	15625	1
19	38	1
20	803	1
21	61	1
22	13875	1
23	875124	1
24	$20-3x-2x^2$	1
25	125	1
26	$x^2+2xy+y^2-z^2$	1
27	24	1
28	True	1
29	True	1
30	False	1
31	False	1
32	True	1
33	True	1
34	False	1
35	False	1

Appendix IV C:

ATTITUDE SCALE IN MATHEMATICS FOR GRADE VIII

2016-2020

Dr.H. INDU
Dean,
School of Education,
Avinashilingam University.

S.YOGESHWARI,
Research Scholar,
Department of Education,
Avinashilingam University.

Dear students

I am researching the topic "Effectiveness of Vedic Mathematics on Achievement in Mathematics and Attitude towards Learning Mathematics among Primary and Upper Primary Students." under the guidance of Dr.H. Indu, Dean, School of Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. This attitude scale in mathematics contains 39 statements with five responses 1. (strongly Disagree) SD, 2. (Disagree) D, 3. (Neutral) N, 4. (Agree) A, 5. (Strongly Agree) SA.

Read the statement carefully and put a circle the appropriate response in the answer sheet given. You are assured that your responses will be kept confidential and it will be used solely for my research work.

CIRCLE THE APPROPRIATE RESPONSES BASED ON THE KEY BELOW STRONGLY DISAGREE, DISAGREE, NEUTRAL/ AGREE, STRONGLY AGREE

Attitude scale: -

1	.I enjoy doing Mathematics	0	1	2	3	4
2	I am confident in solving problems	0	1	2	3	4
3	I find Mathematics easy	0	1	2	3	4
4	I think Mathematics is useful in solving real-world problems	0	1	2	3	4
5	After I have solved a problem, I will look for other methods to solve it	0	1	2	3	4

6	When I know I have made a mistake in solving a problem I will try to find out why	0	1	2	3	4
7	I am good at using mathematics to solve real-life problems	0	1	2	3	4
8	I do not like to think of other ways to solve the same problem	0	1	2	3	4
9	I feel mathematics is important	0	1	2	3	4
10	I find mathematics boring	0	1	2	3	4
11	Once I have worked out an answer to a problem, I do not check my answer	0	1	2	3	4
12	I learn more about mathematics working on my own	0	1	2	3	4
13	I get anxious in school while learning mathematics	0	1	2	3	4
14	I receive good grades on math tests and quizzes	0	1	2	3	4
15	When I see a math problem, I am nervous	0	1	2	3	4
16	I am not eager to participate in discussions that involve mathematics	0	1	2	3	4
17	Mathematics creates interests in me	0	1	2	3	4
18	Math has been my worst subject	0	1	2	3	4
19	Math is hard for me	0	1	2	3	4
20	I don’t think, I could do advanced math	0	1	2	3	4

21	I am not good in math	0	1	2	3	4
22	Math is not important for my life	0	1	2	3	4
23	I'll need mathematics for my future work	0	1	2	3	4
24	I am sure that I can learn math	0	1	2	3	4
25	I will be more eager to find a solution to a problem	0	1	2	3	4
26	Mathematics imbibes concentration, verifying and logical thinking	0	1	2	3	4
27	I wish to be a mathematician	0	1	2	3	4
28	I wish to do calculations rapidly	0	1	2	3	4
29	I find difficult to learn more formulas in mathematics	0	1	2	3	4
30	I am nervous when I have to solve new problems	0	1	2	3	4
31	I am a logical thinker	0	1	2	3	4
32	I like to think about abstract ideas	0	1	2	3	4
33	I am a linear thinker	0	1	2	3	4
34	I find helpless when doing problems in mathematics	0	1	2	3	4

35	I like to come up with new ways to solve math problems	0	1	2	3	4
36	There is nothing creative about mathematics it's just memorizing formulas and things	0	1	2	3	4
37	Mathematics makes me feel uneasy and confused	0	1	2	3	4
38	I am interested and willing to acquire further knowledge of mathematics	0	1	2	3	4
39	Real mathematics problems can be solved by common sense instead of the mathematical formulates	0	1	2	3	4

Appendix IV D:

LEARNING STYLE INVENTORY FOR EIGHTH AND THIRD-GRADE STUDENTS

1. Which class do you like the most?

a) concepts taught through pictures.

b) concepts taught through sound effects.

c) concepts taught through activities.

2. How will you relax yourself?

a) watch movies.

b) hearing most loved songs.

c) drawing pictures.

3. On hearing a devotional song, what will you do?

a) think about God and be silent.

b) start humming along.

c) start dancing and taping the music.

4. How will you direct someone to your home?

a) descriptions of landmarks to your home.

b) tell the names of the places they have to pass through.

c) take them along with you.

5.What kind of prizes do you prefer when you win a game or competition?

a) wall paintings.

b) sound system to hear music.

c) cricket bat.

6. The next day of your school dance program, what will you remember the most?

a) the different persons I saw that day.

b) the music that I heard.

c) the dance steps and the refreshment that I had

7.How do you find the way, when you are in a new place?

a) look on to the map

b) ask someone for the way.

c) just walk around and find the destination.

8. What distracts you the most when you are trying to study?

a) the people around you.

b) the noises around.

c) uncomfortable with the place where you study.

9. How will you study for an examination?

a) Read the books and written notes.

b) someone will assist you in learning by asking questions.

c) prepare small hints and recalling it.

10.On seeing a dog, what will be your reaction?

a) picture a dog in your mind.

b) spell the word dog in your mind.

c) think about playing with dog.

11. What type of books would you love to go through?

a) the books with full of colourful pictures.

b) a book with lot of vocabularies.

c) a book with lot of fun and games.

12. How will you get to know about how computers, machines, video games and other gadgets works?

a) will ask someone.

b) read the manuals and other sources to know about it.

C) learn by own.

13. What do you like to do when you are extremely happy?

a) laugh as much.

b) talk up a storm.

c) will do all activities in hyper.

14. What are the reasons for your distractions in class?

a) the less or more brightness of the classroom.

b) sounds from outside the class.

c) the climatic conditions.

15. Where would you like to go with your friends?

a) magic show.

b) music program.

c) playground.

16.How will you remember your password for an online class?

a) save it as a picture in your phone.

b) byheart by repeatedly saying it.

c) write in your dairy.

17. What will you do when you are waiting for a train.

a) see all peoples around.

b) start to listen music from phone.

c) start playing with your siblings.

18.How, will you spell a word, when you are not aware of the spelling.

a) write down in note to see if it is correct.

b) say the spelling loud.

c) write the spelling in air.

19. In an angry situation what will you do?

a) show your angry face.

b) shout at others.

c) attack the things around you.

20. What would you like to remember about the persons you met?

a) their face.

b) their contact numbers.

c) the things that you spoke to them.

Appendix IV E:

Previous knowledge test on Basic Arithmetic Operation

Class: III **Max marks**: 20

Subject: Mathematics **Time**: 1 hour 30 min

SECTION A (5X1=5)

FILL IN THE BLANKS:

1. 336-118 =…….

2. 6868+478 =……

3. 789+869 = ……

4. 46x57…….

5. 34x11 …….

SECTION B (5X1=5)

CHOOSE THE BEST ANSWER:

6. 682 -569 =……. a)214 b) 113 c)215 d)118

7. 578 + 374 =……. a)972 b)262 c)952 d)867

8. 35x62 = ……. a) 2344 b)2356 c)2170 d)2135

9. 21x18= …… a)378 b)386 c)344 d)234

10. 697-536= ……. a)175 b)161 c)198 d)189

SECTION C (5X1=5)

MATCH THE FOLLOWING:

11. 776+65 =……. a) 123

12. 62 x 41 = …… b) 990

13. 22 x 45 = …… c)18

14. 46-28 = …… d) 841

15. 66+57 =……. e) 2542

SECTION D (5X1=5)

WRITE TRUE OR FALSE:

16. 457+983 is 1440

17. 59 -13 is 45

18. 435-363 = 72

19. 33x56 is 1847

20.26x23 is 590

ANSWER KEY FOR FINAL DRAFT OF PREVIOUS KNOWLEDGE TEST- III GRADE

Question no	Answer	Marks
1	218	1
2	7346	1
3	1658	1
4	2622	1
5	374	1
6	113	1
7	952	1
8	2170	1
9	378	1
10	161	1
11	841	1
12	2542	1
13	990	1
14	18	1
15	123	1
16	True	1
17	False	1
18	True	1
19	False	1
20	False	1

Appendix IV F:

An achievement test based on the designing steps for the sub units basic arithmetic operations, Addition, Subtraction, and Multiplication

STEP 1: Planning of the test

Standard : III

Maximum marks: 20

Maximum time: I hour 30 minutes

Subject : Mathematics

Unit : Basic operation skill

Subunits : Addition, Subtraction, Multiplication.

STEP 2: Preparation of a Design

1. **Weightage to objectives**:

SI. No	objectives	Questions	Marks	%
1	Knowledge	4	4	20
2	Understanding	6	6	30
3	Application	6	6	30
4	Skill	4	4	20
	Total	20	20	100

2. **Weightage to form of questions**:

SI. No	Form of questions	Questions	Mark	%
1	Objective	20	20	100
2	Short answer	-	-	-
3	Essay	-	-	-
	Total	20	20	100

3. **Weightage to content**:

SI. No	Content(subunits)	Questions	Mark	%
1	Addition	6	6	30
2	Subtraction	6	6	30
3	Multiplication	8	8	40
	Total	20	20	100

4. **Weightage to difficulty level:**

Sl. No	Difficulty level	Questions	Mark	%
1	Easy	8	8	40
2	Average	10	10	50
3	Difficult	2	2	10
	Total	20	20	100

5**. Scheme of sections**:

Section	Type of Questions	Number of Questions
A	Objective	20
B	Short Answer	0
C	Essay	0

BLUE PRINT

Objectives / Content	Knowledge			Understanding			Application			Skill			Total
	E	A	D	E	A	D	E	A	D	E	A	D	
Addition		2(1)	1		1		1				1		6
Subtraction			1	1	2(1)		1			1			6
Multiplication				2(1)			1	3(1)		1	1		8
Total		2	2	3	3		3	3		2	2		20
	4			6			6			4			

Number outside the bracket indicates the number of questions

Number inside the bracket indicates the mark each question carries

Achievement test on Vedic Mathematics

Class: III **Max marks**: 20

Subject: Mathematics **Time**: 1 hour 30 min

SECTION A (5X1=5)

FILL IN THE BLANKS:

1. 436 - 218 =…….

2. 7868 + 678 =……

3. 6789 + 7869……

4. 56 x 67…….

5. 34 x 21 …….

SECTION B (5X1=5)

CHOOSE THE BEST ANSWER:

6. 782 -569 =……. a)234 b) 213 c)235 d)218

7. 878 + 394 =……. a)1272 b)1262 c)1256 d)1267

8. 45x67 = ……. a) 4344 b)4356 c)3015 d)3135

9. 23x12= …… a)276 b)286 c)244 d)234

10. 897-564= ……. a)343 b)333 c)345 d)453

SECTION C (5X1=5)

MATCH THE FOLLOWING:

11. 986+85 =……. a) 989

12. 12 x 11 = …… b) 8

13. 23 x 43 = …… c)123

14. 56-48 = …… d) 1071

15. 56 balls + 67 balls =……. e) 132

SECTION D (5X1=5)

WRITE TRUE OR FALSE:

16. 4467 + 3683 is 7150

17. 79 -23 is 55

18. 436-378 = 58

19. 43x76 is 3267

20.36x43 is 1548

Question no	Answer	Marks
1	218	1
2	8546	1
3	14658	1
4	3752	1
5	714	1
6	213	1
7	1272	1
8	3015	1
9	276	1
10	333	1
11	1071	1
12	132	1
13	989	1
14	8	1
15	123	1
16	False	1
17	False	1
18	True	1
19	False	1
20	True	1

Appendix IV G:

ATTITUDE SCALE IN MATHEMATICS FOR GRADE III

2018-2020

Dr.H. INDU
Dean,
School of Education,
Avinashilingam University.

S.YOGESHWARI,
Research Scholar,
Department of Education,
Avinashilingam University.

Dear students

I am doing research on the topic "Effectiveness of Vedic Mathematics on achievement in mathematics and Attitude towards learning mathematics among primary and upper primary students." under the guidance of Dr.H. Indu, Dean, School of Education, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore. This attitude scale in mathematics contains 20 statements and each statement have five responses 1. (strongly Disagree) SD, 2. (Disagree) D, 3. (Neutral) N, 4. (Agree) A, 5. (Strongly Agree) SA.

Read the statement carefully and put a circle the appropriate response in the answer sheet given. You are assured that your responses will be kept confidential and it will be used solely for my research work.

CIRCLE THE APPROPRIATE RESPONSES BASED ON THE KEY BELOW STRONGLY DISAGREE, DISAGREE, NEUTRAL/ AGREE, STRONGLY AGREE

Attitude scale: -

1	I enjoy doing Mathematics	0	1	2	3	4
2	I am confident in solving problems.	0	1	2	3	4
3	I find Mathematics easy	0	1	2	3	4
4	After I have solved a problem, I will look for other methods to solve it	0	1	2	3	4

5	When I know I have made a mistake in solving a problem, I will try to find out why	0	1	2	3	4
6	.I do not like to think of other ways to solve the same problem	0	1	2	3	4
7	I find mathematics boring	0	1	2	3	4
8	I get anxious in school while learning mathematics	0	1	2	3	4
9	I receive good grades on math tests and quizzes	0	1	2	3	4
10	When I see a math problem, I am nervous	0	1	2	3	4
11	Math is hard for me	0	1	2	3	4
12	I am not good in math.	0	1	2	3	4
13	I will be more eager to find a solution to a problem	0	1	2	3	4
14	I wish to do calculations rapidly	0	1	2	3	4
15	I am a logical thinker.	0	1	2	3	4
16	I am a linear thinker.	0	1	2	3	4
17	I find helpless when doing problems in mathematics.	0	1	2	3	4
18	I like to come up with new ways to solve math problems.	0	1	2	3	4
19	Mathematics makes me feel uneasy and confused.	0	1	2	3	4
20	I am interested and willing to acquire further knowledge of mathematics	0	1	2	3	4

முந்தைய அறிவுச் சோதனை - கணிதம்

வகுப்பு : 8 **மதிப்பெண்கள் :** 30

பாடம் : **கணிதம்**

பிரிவு - A (5X1=5)

கோடிட்ட இடங்களை நிரப்புக :

1. 456-218 =…….
2. 7291÷9 =……
3. 438976-ன் கனமூலம் ……
4. 95-ன் சதுரம் …….
5. 113-ன் சதுரம் …….

பிரிவு B (8X1=8)

சரியான விடையைத் தேர்ந்தெடுக்கவும் :

6. 6789 ÷ 9 =…….	a) 754	b) 752	c) 751	d) 750
7. 77÷ 9 =…….	a) 7	b) 9	c) 6	d) 5
8.1225-ன் வர்கமூலம் …	a) 46	b) 35	c) 38	d) 39
9. 17^2 = …….	a) 244	b) 256	c) 289	d) 344
10. 830584-ன் கனமூலம் …	a) 94	b) 93	c) 94	d) 67
11. 13-ன் சதுரம் ...	a) 145	b) 169	c) 144	d) 143
12. 966-ன் சதுரம் …….	a) 99467	b) 933456	c) 933156	d) 996788
13. (2x+3y) (4x+5y) =……	a) $8x^2+22xy+15y^2$	b) $8x+22xy+15y^2$		
	c) $8x^2+22x+15y^2$	d) 8x+22xy+15y		

பிரிவு - C (10X1=10)

பொருத்துக :

14. 796+95 =……..	a) 38
15. 69169-ன் வர்கமூலம் …	b) 803
16. 126-ன் சதுரம் …….	f) 263
17. 346 ÷9=…….	g) 15876
18. 6426÷ 8 =……	i) $20-3x-2x^2$
19. 124 x 112 = ……	j) 891
20. 776 x 999 = ……	k) 775224
21. (5-2x) (4+x) =…….	l) 13888
22. (x +y +z) (x + y - z) ……..	m) 24
23. 13824-ன் கனமூலம் …….	n) $x^2+2xy+y^2-z^2$

பிரிவு - D (7X1=7)

சரியா தவறா என எழுதுக :

24. 95--ன் சதுரம் 9025

25. 89 X 98 என்பது 8722.

26. 436-378 = 156

27. 26569-ன் வர்கமூலம் 163.

28. $(2x+3y)^2$-ன் மதிப்பு $4x^2+12xy+9y^2$

29. 438976-ன் கனமூலம் 76.

30. 222 x 333 என்பது 73927.

அடைவுச் சோதனை - வேதக்கணிதம்

வகுப்பு : 8 **மதிப்பெண்கள் :** 35

பாடம் : **கணிதம்**

பிரிவு A (5X1=5)

கோடிட்ட இடங்களை நிரப்புக :

1. 436-218 =…….

2. 6291÷9 =……

3. 35937-ன் கனமூலம் ……

4. 96ண ……..

5. 112ன் சதுரம் …….

பிரிவு B (8X1=8)

சரியான விடையைத் தேர்ந்தெடுக்கவும் :

6. 6782÷9 =……..	a)754	b)752	c)751	d)750
7. 78÷9 =…… .	a)9	b)7	c) 6	d)5
8. 2304-ன் வர்கமூலம்	a)46	b)47	c)48	d)49
9. 7^3 = …….	a)344	b)345	c)346	d)343
10. 110592-ன் கனமூலம்	a)48	b)46	c)47	d)45.
11. 12-ன் சதுரம் .	a) 145	b)146	c)144	d)143
12. 999--ன் சதுரம் .	a) 997865	b) 998001	c) 996007	d) 98765
13. (2x+3y) (4x+5y) =……	a)$8x^2+22xy+15y^2$		b) $8x+22xy+15y^2$	
	c)$8x^2+22x+15y^2$		d)8x+22xy+15y	

பிரிவு - C (14X1=14)

பொருத்துக :

14. 786+85 =…….	a) 70
15. 69169-ன் வர்கமூலம்	b) 803
16. 6^3=…….	c) 263
17. 998--ன் சதுரம்	d)61
18. 125--ன் சதுரம்	e) 125
19. 356 – 286 =…….	f) 216
20. 6427÷ 8 =……	g)15625
21. 432÷ 7 =…….	h)875124
22. 25 x 11 = ……	i)$20-3x-2x^2$
23. 876 x 999 = ……	j)871
24. (5-2x)(4+x)=…….	k) 996004
25. 15625-ன் வர்கமூலம்	l) 275
26. (x +y +z) (x + y - z) …	m) 24
27. 13824-ன் கனமூலம்	n)$x^2+2xy+y^2-z^2$

பிரிவு - D (8X1=8)

சரியா தவறா என எழுதுக :

28. 95-ன் சதுரம் 9025

29. 79 X 99 என்பது 7821.

30. 436 மாங்காய்கள் + 378 மாங்காய்கள் = 763 மாங்காய்கள்

31. 5^3 = 135.

32. 26569-ன் வர்கமூலம் 163.

33. $(2x+3y)^2$ ன் மதிப்பு $4x^2+12xy+9y^2$

34. 10000-ன் கனமூலம் 10.

35. 286 x 302 என்பது 86374.

எட்டு மற்றும் மூன்றாம் தர மாணவர்களுக்கான கற்றல் பாணி கண்டுபிடிப்பு

1. எந்த வகுப்பை நீங்கள் மிகவும் விரும்புகிறீர்கள்?
   அ) படங்கள் மூலம் கற்பிக்கப்படும் கருத்துக்கள்.
   ஆ) ஒலி விளைவுகள் மூலம் கற்பிக்கப்படும் கருத்துக்கள்.
   இ) செயல்பாடுகள் மூலம் கற்பிக்கப்படும் கருத்துக்கள்.

2. நீங்கள் எப்படி ஓய்வெடுக்கப்போகிறீர்கள்?
   அ) திரைப்படங்கள் பார்ப்பது.
   ஆ) மிகவும் விரும்பப்படும் பாடல்களைக் கேட்பது.
   இ) படங்கள் வரைதல்.

3. ஒரு பக்திப்பாடலைக் கேட்டவுடன் நீங்கள் என்ன செய்வீர்கள்?
   அ) கடவுளைப்பற்றி சிந்திக்க அமைதியாக இருப்பேன்.
   ஆ) அதனுடன் பாடத்தொடங்குவேன்.
   இ) இசைக்கேற்ப தட்டி நடனமாட தொடங்குவேன்.

4. உங்கள் வீட்டிற்கு ஒருவரை எவ்வாறு வழிநடத்துவீர்கள்?
   அ) உங்கள் வீட்டின் அடையாளங்கள் பற்றிய விளக்குவேன்.
   ஆ) அவர்கள் கடந்து செல்ல வேண்டிய இடங்களின் பெயர்களைக் கூறுவேன்.
   இ) அவர்களை உங்களுடன் அழைத்துக் செல்லுவேன்.

5. நீங்கள் ஒரு விளையாட்டு போட்டிகளில் வெற்றிபெரும்போது எந்தவகையான பரிசுகளை விரும்புவீர்கள்?
   அ) சுவர் ஓவியங்கள்.
   ஆ) இசையை கேட்கும் ஒலி அமைப்பு.
   இ) கிரிக்கெட் பேட்.

6. உங்கள் பள்ளி நடன நிகழ்ச்சியின் அடுத்த நாள் நீங்கள் எதை மிகவும் நினைவில் கொள்வீர்கள்?
   அ) அன்று நான் பார்த்த வெவ்வேறு நபர்கள்.
   ஆ) நான் கேட்ட இசை.
   இ) நடன படிகளும் நான் பெற்ற புத்துணர்ச்சியும்.

7. எப்படி நீங்கள் ஒரு புதிய இடத்தில் இருக்கும்போது வழி கண்டறிவீர்?
   அ) வரைப்படத்தை பார்த்து.
   ஆ) யாரிடமாவது வழி கேட்டு.
   இ) வெறுமனே சுற்றி நடந்து சென்று இலக்கை கண்டறிவேன்.

8. நீங்கள் படிக்க முயற்சிக்கும்போது உங்களை மிகவும் திசை திருப்புவது எது?

அ) உங்களைச் சுற்றியுள்ள மக்கள்.

ஆ) சுற்றியுள்ள சத்தங்கள்.

இ) நீங்கள் படிக்கும் இடத்தில் அசௌகரியமாக இருப்பது.

9. தேர்வுக்கு நீங்கள் எப்படி படிப்பீர்கள்?

அ) புத்தகங்கள் மற்றும் எழுதப்பட்ட குறிப்புகளைப் படிப்பேன்.

ஆ) கேள்விகளைக் கேட்பதன் மூலம் கற்றலில் யாராவது உங்களுக்கு உதவுவார்கள்.

இ) சிறிய குறிப்புகளைத் தயாரித்து அதை நினைவு கூருவேன்.

10. ஒரு நாயைப் பார்த்து உங்கள் எதிர்வினை என்னவாக இருக்கும்?

அ) மனதில் ஒரு நாய் கற்பனை செய்வேன்.

ஆ) நாய் என்ற வார்த்தையை மனதில் உச்சரிப்பேன்.

இ) நாயுடன் விளையாடுவதை பற்றி சிந்திப்பேன்.

11. நீங்கள் எந்த வகையான புத்தகங்களை படிக்க விரும்புகிறீர்கள்?

அ) வண்ணமயமான படங்கள் நிறைந்த புத்தகங்கள்.

ஆ) நிறைய சொற்களஞ்சியங்களைக் கொண்ட ஒரு புத்தகம்.

இ) நிறைய வேடிக்கை மற்றும் விளையாட்டுகளை கொண்ட ஒரு புத்தகம்.

12. கணினிகள், இயந்திரங்கள், வீடியோ கேம்கள் மற்றும் பிற கேஜெட்டுகள் எவ்வாறு செயல்படுகின்றன என்பதை நீங்கள் எவ்வாறு அறிவீர்கள்?

அ) யாரிடமாவது கேட்பேன்.

ஆ) அதைப்பற்றி அறிய கையேடுகள் மற்றும் பிற ஆதாரங்களை படிப்பேன்.

இ) தானாகவே கற்றுக்கொள்வேன்.

13. நீங்கள் மிகவும் மகிழ்ச்சியாக இருக்கும்போது என்ன செய்ய விரும்புவீர்கள்?

அ) அதிகமாக சிரிப்பேன்.

ஆ) புயலைப் பற்றி பேசுவேன்.

இ) அனைத்து செயல்பாடுகளையும் மிகைப்படுத்திச் செய்வேன்.

14. வகுப்பில் உங்கள் கவனச்சிதறல்களுக்கு என்ன காரணம்?

அ) வகுப்பறையின் வெளிச்சம் குறைவாகவோ அல்லது அதிகமாகவோ இருக்கும்.

ஆ) வகுப்பிற்கு வெளியில் இருந்து வரும் ஒலிகள்.

இ) பருவநிலை.

15. உங்கள் நண்பர்களுடன் நீங்கள் எங்கு செல்ல விரும்புகிறீர்கள்?

அ) மேஜிக் ஷோ.

ஆ) இசை நிகழ்ச்சி.

இ) விளையாட்டு மைதானம்.

16. எவ்வாறு நீங்கள் ஒரு ஆன்லைன் வகுப்பின் கடவுச் சொல்லை நினைவில் வைப்பீர்கள்?

அ) அதை உங்கள் தொலைபேசியில் ஒரு படமாக சேமிப்பேன்.

ஆ) அதை மீண்டும் மீண்டும் சொல்வதன் மூலம் ஞாபகம் வைத்துக்கொள்வேன்.

இ) குறிப்பேட்டில் எழுதுவேன்.

17. நீங்கள் ரயிலுக்காகக் காத்திருக்கும்போது என்ன செய்வீர்கள்?

அ) சுற்றியுள்ள அனைத்து மக்களையும் பார்ப்பேன்.

ஆ) தொலைபேசியிலிருந்து இசையைக் கேட்கத் தொடங்குவேன்.

இ) உடன்பிறப்புகளுடன் விளையாடத் தொடங்குவேன்.

18. ஒரு சொல்லின் எழுத்தை அறியாதபோது நீங்கள் எவ்வாறு அச்சொல்லை உச்சரிப்பீர்கள்?

அ) அது சரியா என்று பார்க்க குறிப்பில் எழுதுவேன்.

ஆ) எழுத்தை சத்தமாக சொல்லிப் பார்ப்பேன்.

இ) எழுத்தை காற்றில் எழுதுவேன்.

19. கோபமான சூழ்நிலையில் நீங்கள் என்ன செய்வீர்கள்?

அ) கோபமான முகத்தைக் காட்டுங்கள்.

ஆ) மற்றவர்களைக் கூப்பிடுவேன்.

இ) சுற்றியுள்ளவற்றைத் தாக்குங்கள்.

20. நீங்கள் சந்தித்த நபர்களைப் பற்றி நீங்கள் என்ன நினைவில் கொள்ள விரும்புகிறீர்கள்?

அ) அவர்களின் முகம்.

ஆ) அவர்களின் தொடர்பு எண்கள்.

இ) நீங்கள் அவர்களிடம் பேசிய விஷயங்கள்.

முந்தைய அறிவுச் சோதனை - கணிதம்

வகுப்பு : 3 **மதிப்பெண்கள்** : 20

பிரிவு - A (5X1=5)

கோடிட்ட இடங்களை நிரப்புக :

1. 336-118 =…….

2. 6868+478 =……

3. 789+869 = ……

4. 46x57…….

5. 34x11 …….

பிரிவு B (5X1=5)

சரியான விடையைத் தேர்ந்தெடுக்கவும் :

6. 682 -569 =…….	a)214	b) 113	c)215	d)118
7. 578 + 374 =…….	a)972	b)262	c)952	d)867
8. 35x62 = …….	a) 2344	b)2356	c)2170	d)2135
9. 21x18= ……	a)378	b)386	c)344	d)234
10. 697-536= …….	a)175	b)161	c)198	d)189

பிரிவு - C (5X1=5)

பொருத்துக :

11. 776+65 =…….	a) 123
12. 62 x 41 = ……	b) 990
13. 22 x 45 = ……	c)18
14. 46-28 = ……	d) 841
15. 66+57 =…….	e) 2542

பிரிவு - D (5X1=5)

சரியா தவறா என எழுதுக :

16. 457+983 என்பது 1440

17. 59 -13 என்பது 45

18. 435-363 = 72

19. 33x56 என்பது 1847

20.26x23 என்பது 590

அடைவுச் சோதனை - வேதக்கணிதம்

வகுப்பு : 3 **மதிப்பெண்கள்** : 20

பாடம் : **கணிதம்**

பிரிவு - A (5X1=5)

கோடிட்ட இடங்களை நிரப்புக :

1. 436-218 =…….

2. 7868+678 =……

3. 6789+7869……

4. 56x67…….

5. 34x21 …….

பிரிவு - B (5X1=5)

சரியான விடையைத் தேர்ந்தெடுக்கவும் :

6. 782 -569 =…….a)234 b)213c)235d)218

7. 878 +394 =……. a)1272b)1262 c)1256d)1267

8. 45x67 = ……. a) 4344 b)4356 c)3015 d)3135

9. 23x12= ……a)276 b)286 c)244 d)234

10. 897-564= ……. a)343b)333 c)345 d)453

பிரிவு - C (5X1=5)

பொருத்துக :

11. 986+85 =…….a)989

12. 12 x 11 = ……b)8

13. 23 x 43 = …… c)123

14. 56-48 = ……d)1071

15. 56 balls +67 balls =……. e)132

பிரிவு - D (5X1=5)

சரியா தவறா என எழுதுக :

16. 4467+ 3683 என்பது 7150

17. 79 -23 என்பது 55

18. 436-378 = 58

19. 43x76 என்பது 3267

20.36x43 என்பது 1548

APPENDIX – V

VEDIC MATHEMATICS PACKAGE FOR BASIC MATHEMATICAL OPERATIONS (VMPBMO)

APPENDIX – VII

PUBLICATION

Avinashilingam Institute for HomeScience and Higher Education for Women
(Deemed to be University Estd. u/s 3 of UGC Act 1956, Category 'A' by MHRD
Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC
Coimbatore - 641 043, Tamil Nadu, India

Appendix L2

(Item No 5 of Check List) Details of Research Publications

S.No	Article	Journal	Other Details Vol/No/Page No/ Year	Published in UGC-CARE / Scopus Indexed/ Web of Science
1	EFFECTIVESS OF VEDIC MATHEMATICS BASED INSTRUCTION ON THE ACHIEVEMENT IN MATHEMATICS BASED ON GENDER	NATIONAL JOURNAL OF EDUCATION	Vol XIX NO(2) July 2021 pg:153-162	UGC CARE-I
2	THE IMPACT OF VEDIC MATHEMATICS SUTRAS BASED INSTRUCTION ON ATTITUDES TOWARDS MATHEMATICS AMONG THIRD GRADE STUDENTS: A GENDER-BASED ANALYSIS	IJISAE International Journal of intelligent systems and Applications in Engineering	PAPER ACCEPTED	SCOPUS INDEXED

*Proof of list of Journals from Internet to be attached along with copies of reprints.

Scholar : YOGESHWARI.S

Supervisor : Dr. H. INDU

Checked By:

HoD/Dean of Respective School

The scholar Miss. Yogeswari, S (16PHEDP003) has published/ article accepted in the following journals:

1. National Journal of Education - indexed and active in UGC Care List Group I and
2. International Journal of Intelligent Systems and Applications in Engineering – indexed and active in Scopus. Her paper accepted in this journal.

This may be considered.

14.08.2024.

National Journal of Education, ISSN 0972 9569
Vol. XIX No. (2), July 2021 Published in May 2023

Effectiveness of Vedic Mathematics-based Instruction on the Achievement in Mathematics based on Gender.

Yogeshwari. S* H. Indu**

Abstract

There exists a problem of learning Mathematics with not only the students but all the folks learning mathematics. Intricate and complex formulas and the skeptical series of methods to solve a problem might be the main reason for this problem of learning mathematics. To eradicate this fear, plenty of easy methods are being brought up by experts. Vedic Mathematics which is a combination of verses and sutras which was persuaded by ancient Indians and was believed to be a competent system of mathematics. This Vedic mathematics is being encased by the experts for the current generation to ease learning and minimize the fear of learning mathematics. This paper is focused on the effectiveness of Vedic mathematics on achievement in mathematics based on gender. The study involves 160 third-grade students, involving two groups, one group taught through the conventional method (control group) and the other taught through Vedic mathematics (experimental group). A 'Pre-test and post-test nonequivalent control group design' were used in this study. The Vedic method applied in the experiment group employed for girls and boys separately indicates the group taught through Vedic mathematics obtained significantly higher mean achievement.

Keywords: *Vedic mathematics, Achievement in mathematics, III grade students.*

Introduction

Education is the platform to bring out the potential inherent in man and makes him much more productive in his actions. Mathematics plays a vital part in the field of education and acts as the basis for logical reasoning, abstract thinking, and the development of reasoning. Mathematics is the foundation for all other subjects, so learning mathematics is more important. Learning mathematics mainly depends on the methods followed in teaching and learning as well.**"**The

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school curriculum aims to enable learners to acquire knowledge, develop understanding and inculcation of skills, positive attitude, values, and habits conducive to the all-round development of their personality**"** (National curriculum framework for school education,2005).The present school curriculum is framed such that it acquires all the values given above but it can also focus on the various methods that can be used to teach and joyfully learn mathematics. Most of the students consider mathematics as a difficult subject as it takes more time, needs more patience and it takes more effort to solve problems. For these reasons, most of the students started to ignore learning mathematics. Vedic mathematics is an ancient treasure that makes learning mathematics easier and quicker. This study analyzed the effectiveness of Vedic mathematics on achievement in mathematics among boys and girls third-grade students.

Vedic Mathematics

Vedic mathematics was reframed by Indian monk Jagadguru Swami Sri Bharati Krishna Tirthaji Maharaj.Vedic mathematics involves sixteen sutras and thirteen sub-sutras through which all mathematical calculations can be performed cheerfully. Mathematical problems which involve many formulas and numerous steps can be solved in a few steps by Vedic mathematics. In addition to basic arithmetic operations, higher mathematics which includes algebra, trigonometry, calculus, integration, differentiation, and many others can also be solved using those sixteen Vedic mathematics sutras cheerfully and blissfully. Since this study involves only third-grade students only basic arithmetic operations such as addition, subtraction, and multiplication are taught to the children. **Smitha (2014)** conducted research focusing on the ancient Indian Treasure of Vedic Algorithm, the 'Anurupyena' method. The study consisted of 240 secondary students selected based on the cluster sampling technique. The results found that the Vedic sutra, 'Anurupyena' used for calculating cubic values is more efficient in increasing the speed of calculation among the students, and the data shows that the applications of 'Anurupyena'sutra is more useful than the traditional method of teaching mathematics in improving computation speed. **Rajesh (2015)** attempted to analyze the efficiency of teaching mathematics through the Vedic method in the achievement of secondary students. The study consisted of 200 students as the sample, taking 50 boys and 50 girls from class 9, and the same number of samples including both genders from class 10 was taken for the study. The schools were identified purposively, and the groups of the experiments were selected using the method

of randomization. The researcher selected a stratified random sampling technique. This study revealed that boys of standards 9^{th} and 10^{th} acquired high mathematics achievement through the Vedic mathematics-assisted teaching method similarly girls have acquired high achievement. **Dhivyadeepa (2014)** investigated the effect of the Vedic method of teaching mathematics in performing subtraction. This study involved 24 students in grade four. The parallel group experimental method was used in the study. Research self-mode achievement test was given for pre and post-tests. The study revealed that the achievement means scores between the pre-test and post-test of the controlled group have no significant difference. It was also found that the difference in the mean score achievement between the pre and post-test of the experimental group was significant, and it also showed a difference in achievement scores between post-tests of the experimental and controlled group significantly. **Vyas (2020)** has tried to find the effect of teaching mathematics through Vedic methods taking into consideration a few variables for ninth-grade school students. Post-test equivalent group experimental design was adopted in the research. A sample consisting of 160 students was selected for the study and 40 students in each group were chosen. It was found that the Vedic method of teaching mathematics was more efficient than the conventional method in the student's achievement in mathematics subjects and in the achievement of girls in mathematics subjects. It was also found that Vedic mathematics was more effective for lower-achievement students in mathematics. The researcher also found that the Vedic mathematics method was more effective in the achievement of boys than girls. **Amulya (2021)** tried to find the effectiveness of the Vedic method on multiplication for sixth graders. The researcher used the Vedic method of multiplication as an independent variable to know the effect on the achievement of students in an experimental setting of 58 students of class vi who were selected randomly by using the blindfold method from four upper primary schools. The schools were selected using the purposive sampling method. 28 students were taken and taught through the conventional method (control group) and 30 students were chosen and taught through the Vedic method (experimental group). A randomized pre-test and post-test equivalent group design were chosen in the research. Two self-made achievement tests on multiplication have been used one each for the pre and post-test. The results showed that the Vedic method of multiplication is effective while considering the achievement of students over the conventional method in the post-test. It was also revealed that the boys and girls in the experimental group had

achieved high in the post-test and the difference between the two means had no significant difference.

Statement of the Problem

The researcher tried to find whether there is more effectiveness in teaching mathematics through the Vedic method based on the sub-sample gender. The researcher also tries to know the differential effect of gender on achievement in mathematics for both the conventional method of teaching and Vedic Mathematics-based instruction. Hence, the researcher framed the title of the problem as 'Effectiveness of Vedic mathematics-based instruction on the achievement in mathematics based on gender.'

Need of the Study

Vedic mathematics redefines the negative perspective of most learners towards learning mathematics. Vedic mathematics consists of sutras that help in solving problems in an easier and quicker method. Through Vedic methods, the problems are solved in very few steps, and this automatically increases the confidence level of the students, and they feel fear-free in learning mathematics which will help in making mathematics learning, an interesting and joyful one.

Objectives of the research

1. To test the effect of Vedic mathematics-based instruction on achievement in mathematics of the students taught through the conventional methods and those who were taught through Vedic methods for sample employed for girls and boys separately**.**
2. To compare the mean achievement post-test score in mathematics of third-grade students based on their gender for both the students taught through the conventional method and those who were taught through Vedic methods for sample employed for girls and boys separately**.**

The Hypothesis of the Study

1. Vedic mathematics-based instruction does not affect the achievement in mathematics of the students taught through the conventional methods and those who were taught through Vedic methods for sample employed for girls and boys separately**.**
2. There exists no significant difference in the mean post-test score of achievement in mathematics of third-grade students based on their gender for both the control and experimental group separately.

Sample Selected

The samples selected for the study were 160 students from the third grade of which 80 were taken as the experimental group and 80 as the controlled group. The sample chosen for the study is given in Table 1.

Table 1: Sample Distribution of the Study

Type of school	Experimental group	Controlled group	Total
Boys	39	25	64
Girls	41	55	96
Total sample	80	80	160

Tools

In this study, the researcher framed and validated a Vedic mathematics-based instruction package. An achievement test in mathematics was also constructed and standardized. The researcher also established the reliability and content validity of the prepared tool. The achievement test consists of 40 items initially. Based on the expert's opinion, the items were reduced to 32 items. The pilot study was done with a sample of 100 samples of third-standard. Based on item analysis and item discrimination few items were deleted and the remaining 20 items were considered for the study. Vedic mathematics-based instruction module was constructed based on the Tamil Nadu state board syllabus prescribed for the third grade. The module unambiguously explains the steps followed in the Vedic method to calculate the basic arithmetic operation, addition, subtraction, and multiplication.

Analysis of the Data

1. **Hypothesis 1:**Vedic mathematics-based instruction has no effect on the achievement in mathematics of the students taught through the conventional methods and those taught through Vedic methods for sample employed for girls and boys separately**.**

   The investigator, to know whether the Vedic Math method was effective for female and male students separately employed an independent sample t-test. The result of the statistical analysis is presented in Table 2.

Table 2: The Significance test of Difference in the Mean Post-test Scores of Achievement Test of the Control and Experimental Group for the subsample Gender

Sub Sample	Variable	Group	*n*	*M*	*SD*		*p*
Girls	Achievement	Control	55	11.89	2.63	7.014*	*p*< 0.0001
		Experimental	41	16.16	2.25		
Boys	Achievement	Control	25	11.16	2.21	6.965*	*p*< 0.0001
		Experimental	39	14.89	2.22		

Note. ** denotes the value is significant at the .01 level

n= no. of students, M=Mean, SD = Standard Deviation, r = coefficient of correlation, t= t value, p = probability

As per Table 2, the *t* value obtained for the significance test of the difference in the post-test score of achievement in mathematics of the students taught through the conventional methods and those were taught through Vedic methods for the subsample girl is 7.014, which is said to be more than the table value 1.96. Therefore, the difference is significant.

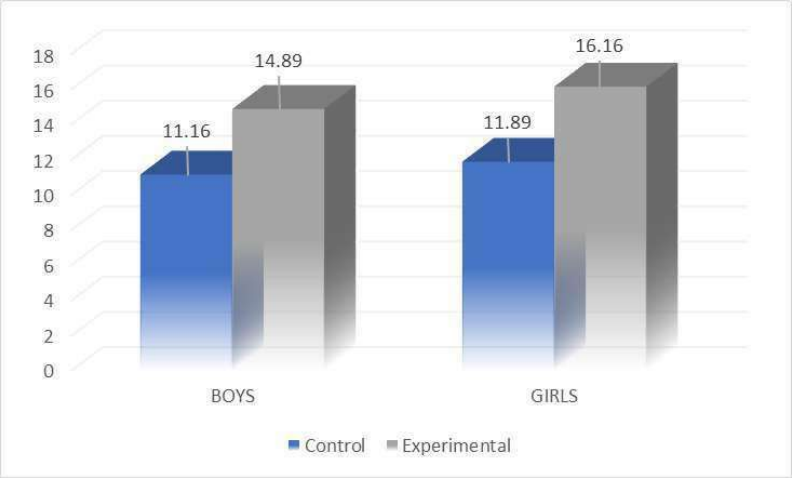
The significance test of the difference in the post-test achievement score of the students taught through the conventional methods and the students taught through the Vedic methods for male students gives a t value of 6.965 which is greater than 1.96 and hence significant.

Discussion

The significance test of the difference in the mean post-test value of achievement between the students taught through the conventional method (control group) and the students taught through the Vedic method (experimental group) employed for girls and boys separately shows that the students taught through the Vedic method obtained significantly greater mean achievement scores in the post-test. This denotes that the Vedic method applied in the III grade experiment

group has a considerable effect on mathematics achievement. Hence Hypothesis 1 is rejected.

Figure 1: Graphical Representation of the Difference in the Mean Score of Achievement In Mathematics of Control And Experimental Group For The Sub-Sample Classified Based on Gender



Hypothesis 2: There exists no significant difference in the mean post-test score of achievement in mathematics of third-grade students based on their gender for the control and experimental group separately.

The investigator tried to find whether the difference in the mean post-test score of achievement in mathematics differs with gender. The analysis result is presented in Table 3.

Table 3: *The Test for Significant Difference in the Mean Post-test Scores of Achievements in Mathematics Test for the subsample Gender*

Group	Variable	Sub Sample	*n*	*M*	*SD*		*p*
Control	Achievement	Boys	31	20.35	5.25	2.589*	0.011
		Girls	49	23.08	4.13		
Experiment	Achievement	Boys	55	24.05	4.90	5.173*	*p*< 0.0001

		Girls	25	17.60	5.73		

Note. ** denotes the value is significant at the .01 level

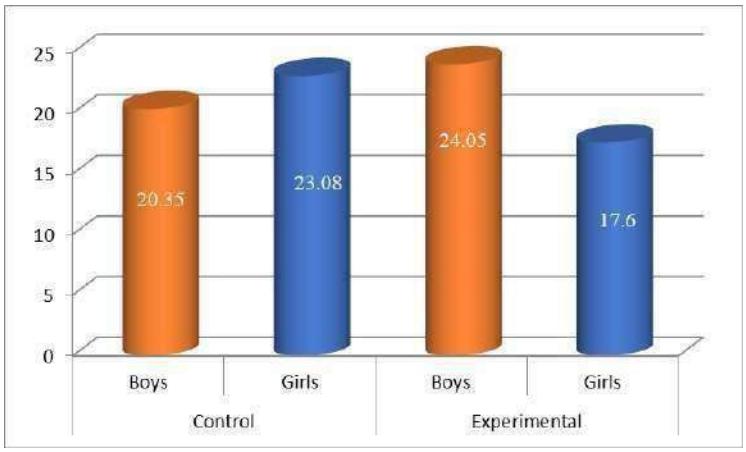
n= no. of students, M=Mean, SD = Standard Deviation, r = coefficient of correlation, t= t value, p = probability

Table 3 infers that the mean score obtained for boys in the control group is 20.35 (SD = 5.25) and for girls is 23.08 (4.13). The t value is obtained as 2.589 with a *p-value* of 0.011.

Table 3 also denotes the boys taught through Vedic mathematics have a mean post-test score of 24.05 with an SD of 4.90 and the boys obtained 17.60 (SD= 5.73). Meanwhile, the girls secured a mean score of 17.60 with an SD of 5.73. The value is found to be 5.173 at a .01 level of significance, with a p-value less than 0.0001. The obtained t value is higher than the critical ratio at a .01 confidence level. Therefore, the hypothesis is rejected.

The difference in the mean score in math achievement is represented with the help of a graph in Figure 2.

Figure 2: Difference in The Mean Score of Achievement In Mathematics Of Control And Experimental Group Based On Gender



Discussion of the Results

The t value obtained for the difference in the mean post-test score of achievement in mathematics of the girl students of the students taught through the conventional method (Control group) and the students taught through Vedic methods (Experimental group) is found to be (7.014) greater than the critical ratio at a .01 level. Hence the mean score of the girls from the

students taught through the Vedic method(experimental group) is greater than those of thestudents taught through the conventional method (control group).

The mean score of boys from the students taught through Vedic methods (Experimental group) is found to be significantly greater than the boys from the group taught through conventional methods (Control group). Since, the value of the test of significance, (6.965) is more than the table value at a .01 level of confidence.

The t value of the difference in the mean post-test score of the students taught through the conventional method (control group) for the sub-sample gender is obtained as 2.589 which is more than the table value at a .01 confidence level. The mean score of girls is found to be significantly greater than that of boys. At the same time, the boys from the group taught through Vedic mathematics (experimental group) are observed to be greater than the girls, with a t value of 5.173. The t-value denotes that the difference is significant at a 0.01 level of significance. Vedic mathematics is more effective in boys, denotes the analysis.

Findings of the Study

- The mean post-test scores of girls in the group taught through Vedic methods (experimental group) are significantly greater than the group taught through the traditional method (control group).
- The mean post-test scores of boys from the group taught through Vedic methods (experimental group) are significantly greater than the mean post-test score of the group taught through the conventional method (control group).
- The Vedic method of teaching mathematics is found to be significantly effective in contrast to the conventional method of mathematics teaching
- The post-test scores of girls from the group taught through the conventional method (control group) holds to be significantly greater than those of boys.
- The boys from the group taught through Vedic methods (Experimental group) have significantly greater mean post-test scores compared to the girls from the group taught through Vedic methods (Experimental group).
- The Vedic method of teaching Mathematics is more effective in boys when compared to the girls of the group taught through Vedic methods (Experimental group).

Conclusion

Vedic mathematics helps to solve problems in a much easier and quicker way. It allows the learners to understand the problem deeply and facilitate solving problems in less time. Even the most complex problems can be solved efficiently through Vedic mathematics. It increases the concentration of the students and improves their retention capacity. The inclusion of Vedic mathematics in the school curriculum can facilitate the learners to study mathematics in a fear-free atmosphere. This will increase the achievement level of the students and help them stay confident.

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The Impact of Vedic Mathematics Sutras-Based Instruction on Attitude towards Mathematics among Eighth-Grade Students: A Gender-Based Analysis

Yogeshwari S[a], Dr. H. Indu[b]

Submitted:18/09/2024 **Revised**: 30/10/2024 **Accepted**: 10/11/2024

Abstract: Education is the cornerstone of any nation, shaping the future of generations and laying the groundwork for a thriving society. In this context, the shift from rote memorization to skill-based education is critical for fostering critical thinking, problem-solving abilities, and lifelong learning. Among the core subjects, mathematics often stands out as one of the most challenging areas for students, requiring a fundamental change in teaching approaches to make it more accessible and engaging.

Mathematics, despite its significance, is frequently perceived as a daunting subject within the school curriculum. Many students struggle with it due to its abstract concepts, logical reasoning, and cumulative nature, which builds upon prior knowledge. These challenges often result in a negative attitude toward mathematics, leading to avoidance and poor performance. As a result, there is a pressing need to adopt innovative teaching methods that transform mathematics learning into a more enjoyable and interactive experience.

One such approach is Vedic Mathematics, an ancient system of mathematical principles rooted in the Vedas. This system offers a rich collection of techniques designed to simplify complex calculations and enhance students' mathematical understanding. The sutras, or aphorisms, within Vedic Mathematics, provide intuitive and efficient strategies that empower students to solve intricate problems with ease and confidence. By leveraging the simplicity and elegance of these methods, Vedic Mathematics not only deepens comprehension but also makes learning mathematics a joyful and rewarding experience.

This study aims to examine how teaching methods based on Vedic Mathematics sutras influence students' attitudes toward learning mathematics, with a particular focus on gender differences. By exploring the effectiveness of this instructional approach, the research seeks to determine whether Vedic Mathematics can foster a more positive attitude toward mathematics among eighth-grade students. Additionally, the study will investigate how gender impacts receptiveness to and benefits derived from Vedic Mathematics. Ultimately, the goal is to contribute valuable insights into developing inclusive and engaging strategies for teaching mathematics, ensuring that all students can thrive in this essential discipline.

The study involved 160 eighth-grade students, divided into a control group and an experimental group. A 'pre-test post-test control group design' was utilized to assess the impact of Vedic Mathematics instruction. In the experimental group, the Vedic Mathematics teaching approach was implemented separately for boys and girls. The results revealed a significantly higher mean attitude score among students in the experimental group, indicating the positive influence of Vedic Mathematics instruction on their attitude toward learning mathematics.

Keywords: *Vedic mathematics, Attitudes towards learning mathematics, Eighth-Grade students.*

Introduction:

Education is a powerful tool for unlocking individuals' inherent potential and enabling them to contribute productively to society. Within the broader realm of education, mathematics holds a pivotal role as it fosters logical reasoning, critical thinking, and analytical problem-solving skills. Its significance extends beyond the classroom, forming the backbone of numerous disciplines and everyday applications. However, the effectiveness of mathematics education is heavily influenced by the teaching methods employed, which can shape students' attitudes and performance in the subject.

The National Curriculum Framework for School Education (2005) emphasizes the importance of a well-rounded curriculum that develops knowledge, skills, positive attitudes, and values that contribute

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to holistic personal growth. While these principles guide current educational practices, there is a pressing need to explore diverse and innovative methods to make mathematics learning both engaging and effective.

Despite its importance, mathematics is often perceived as one of the most challenging subjects. Many students struggle with its abstract nature, the persistence it demands, and the cumulative knowledge required for problem-solving. This struggle leads to a widespread aversion to the subject, negatively impacting students' confidence and performance. Addressing these challenges calls for teaching approaches that not only simplify mathematical concepts but also instill enthusiasm and confidence in learners.

One promising approach is Vedic Mathematics, an ancient system derived from the Vedas. Renowned for its simplicity and efficiency, Vedic Mathematics offers a set of techniques that make calculations faster and more intuitive. These methods not only simplify complex problems but also enhance students' understanding and appreciation of mathematical concepts, transforming the learning process into a more enjoyable and rewarding experience.

This study explores the impact of Vedic Mathematics on the attitudes of eighth-grade boys and girls toward learning mathematics. It investigates whether this innovative approach can improve students' perceptions of the subject, enhance their performance, and foster a positive and confident outlook toward mathematics.

Vedic Mathematics:

Vedic Mathematics, as revitalized by Indian monk Swami Bharati Krishna Tirthaji Maharaj, derives its principles from the ancient Vedas, where the term 'Veda' translates from Sanskrit as 'knowledge.' This system comprises sixteen sutras and thirteen sub-sutras, providing a simplified and joyful approach to mathematical calculations. Using Vedic Mathematics, complex problems requiring multiple formulas and lengthy processes can often be solved in just a few steps. Its methods extend beyond basic arithmetic to include advanced topics like algebra, trigonometry, calculus, integration, differentiation, and more. However, since this study focuses on eighth-grade students, the instruction was limited to basic arithmetic operations.

Numerous studies have explored the impact of Vedic Mathematics on students' mathematical performance and attitudes. Smitha (2014) focused on the ancient Indian treasure of the Vedic Algorithm, particularly the 'Anurupyena' method, in a study involving 240 secondary students selected via cluster sampling. The findings revealed that the Vedic sutra 'Anurupyena' significantly improved students' computational speed compared to traditional methods. Similarly, Rajesh (2015) analyzed the impact of Vedic Mathematics on academic achievement among secondary students, involving 200 participants (equally divided between boys and girls from grades 9 and 10) using stratified random sampling. The results demonstrated that students taught using Vedic Mathematics achieved higher scores than those taught using conventional methods.

Dhivyadeepa (2014) investigated the effectiveness of Vedic Mathematics in enhancing subtraction performance among 24 fourth-grade students using a parallel group experimental design. The post-test results indicated a significant improvement in the experimental group, showcasing the benefits of Vedic methods. Vyas (2020) studied the impact of Vedic Mathematics on ninth-grade students' mathematical achievement, involving 160 participants in a post-test equivalent group experimental design. The findings highlighted the superiority of Vedic Mathematics over traditional methods, particularly for lower-achieving students and boys.

Amulya (2021) examined the influence of the Vedic method on multiplication skills among 58 sixth-grade students using a randomized pre-test and post-test equivalent group design. The results revealed that students taught using Vedic methods demonstrated a significant improvement in their multiplication skills compared to those taught using traditional methods. Gender analysis indicated no significant difference in performance, suggesting that the Vedic approach benefits both boys and girls equally.

In addition to studies focused on performance, some research has explored the impact of Vedic Mathematics on students' attitudes toward the subject. Srinivasan (2018) conducted a study on eighth-grade students to analyse changes in their perception of mathematics after exposure to Vedic methods. The study revealed that students developed a more positive attitude toward the subject, citing

increased confidence and reduced anxiety during problem-solving. Another study by Gupta and Mehta (2019) involved 150 middle school students and highlighted that the simplified techniques of Vedic Mathematics fostered a sense of achievement and enthusiasm for learning mathematics, ultimately enhancing students' overall attitude toward the subject.

A more recent study by Sharma and Das (2022) examined the role of Vedic Mathematics in reducing math anxiety among seventh-grade students. The findings revealed that students in the experimental group reported lower levels of anxiety and greater interest in mathematics compared to the control group. These results suggest that the engaging and simplified methods of Vedic Mathematics not only improve performance but also positively influence students' attitudes, making mathematics more approachable and enjoyable.

Collectively, these studies underscore the potential of Vedic Mathematics as a transformative teaching tool. Its techniques enhance not only computational abilities but also students' attitudes, confidence, and interest in mathematics across different grade levels and genders.

Attitude Toward Learning Mathematics

Many students perceive mathematics as challenging due to its abstract nature, intricate formulas, and complex methods. These perceptions significantly influence students' attitudes toward learning the subject, which in turn affects their engagement and proficiency. A positive attitude toward mathematics can empower students to grasp concepts more effectively, overcome challenges, and perform better academically. This study investigates the influence of Vedic Mathematics on students' attitudes toward mathematics, with a focus on understanding how innovative teaching methods can shape perceptions and enhance learning experiences.

Attitude, as defined by Allport (1935), is “a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence upon an individual’s response to all objects and situations to which it is related.” In the context of mathematics, a student's attitude reflects their feelings, beliefs, and predispositions toward the subject, which can either facilitate or hinder learning. Mathematics, being a foundational subject with applications in various aspects of life, requires students to develop a positive outlook to achieve not only academic success but also to equip themselves with essential skills for personal and professional growth.

Several factors influence students’ attitudes toward mathematics, including teaching methods, classroom environment, parental support, and prior experiences. A positive attitude acts as a driving force, enabling students to approach mathematical problems with confidence, perseverance, and creativity. On the other hand, a negative attitude can lead to avoidance, anxiety, and poor performance, creating a cycle of disengagement. Therefore, fostering a constructive attitude toward mathematics is essential for both individual and societal development.

Research has highlighted the strong relationship between attitude and mathematical achievement. Mensah, Okyere, and Kuranchie (2013) conducted a study to examine the relationship between students' attitudes and their performance in mathematics. They found a significant positive correlation, emphasizing that a favorable attitude enhances understanding and achievement. Kumar (2020) similarly reported a significant relationship between attitude and achievement in mathematics, underscoring the importance of nurturing positive perceptions through engaging and student-centered teaching strategies.

Mzomwe (2019) explored the role of teaching methods in shaping attitudes and argued that while attitude is a critical factor, the instructional strategies employed by teachers play an equally important role in influencing learning outcomes. Das (2015) reinforced this view, highlighting that students with positive attitudes were more likely to excel in mathematics, and their success further reinforced their favorable perceptions of the subject. Sujata (2017) investigated gender differences in attitudes toward mathematics and found no significant variation between boys and girls. However, the study reaffirmed the strong correlation between a positive attitude and higher achievement in mathematics, regardless of gender.

Additional studies support these findings. Aiken (1976) emphasized the importance of attitude in determining success in mathematics and proposed that effective teaching methods can significantly improve students’ perceptions. Hannula (2002) developed a theoretical framework to understand the dynamics of attitudes, emotions, and beliefs in mathematics education, concluding that positive

experiences in mathematics learning are key to fostering favorable attitudes. Ma and Kishor (1997), through a meta-analysis, demonstrated that students with positive attitudes toward mathematics consistently outperformed their peers with neutral or negative attitudes.

In summary, fostering a positive attitude toward mathematics is crucial for improving students' engagement, reducing anxiety, and enhancing academic performance. By employing innovative teaching methods such as Vedic Mathematics, educators can create a more inclusive and enjoyable learning environment, empowering students to view mathematics as an accessible and valuable subject.

Methodology:

The experimental method is a systematic and scientific approach to address research problems by testing hypotheses and analysing outcomes. This study adopts a Pretest-Post test Control Group Design to evaluate the impact of Vedic Mathematics on students' attitudes toward learning mathematics.

Sample

The study involved 160 eighth-grade students as participants. A random sampling technique was employed to ensure that the selection process was unbiased and representative of the population. The students were then divided equally into two groups: an experimental group and a control group.

The experimental group received instruction using Vedic Mathematics methods, while the control group continued with the standard curriculum. Before the intervention, a pretest was administered to both groups to establish baseline measures of their attitudes toward mathematics. This initial assessment ensured that any observed changes in attitudes could be attributed to the intervention.

Following the intervention period, a post-test was conducted for both groups. The post-test results were analysed to determine any differences in attitudes toward mathematics, thereby assessing the effectiveness of Vedic Mathematics in fostering positive attitudes among the students.

Table 1:

Distribution of the Sample

Gender	Experimental group	Controlled group	Total
Boys	55	31	86
Girls	25	49	74
Total	80	80	160

Tools:

The researcher developed two primary tools for the study: a comprehensive instructional module and an "Attitude Towards Learning Mathematics" scale.

The instructional module was designed in alignment with the Tamil Nadu State Board syllabus for eighth grade and focused on elucidating the concepts and procedures necessary for understanding basic arithmetic operations such as addition, subtraction, and multiplication. The module incorporated innovative Vedic Mathematics techniques to enhance students' engagement and comprehension.

The "Attitude Towards Learning Mathematics" scale was initially constructed with 51 items aimed at measuring students' attitudes toward mathematics. After receiving feedback from two education experts, the scale was refined to 42 items. To ensure the validity and reliability of the scale, a pilot study was conducted. During this process, item analysis and item discrimination were performed, leading to the further refinement of the scale, which ultimately comprised 39 items. This standardized scale was used to assess the changes in students' attitudes toward mathematics.

Objectives:

1. To assess the impact of Vedic mathematics-based instruction on the attitude toward learning mathematics among eighth-grade students in the control and experimental groups, analysed separately for girls and boys.

2. To compare the mean post-test scores of attitude toward learning mathematics between boys and girls in the control and experimental groups separately.

Hypothesis:

1. Vedic mathematics-based instruction does not significantly impact the attitude toward learning mathematics among students in the control and experimental groups, analysed separately for girls and boys.

2. There is no significant difference in the mean post-test scores of attitude toward learning mathematics between boys and girls in the control and experimental groups, analysed separately.

Need of the study:

Attitude is a key factor that influences success, encompassing an individual's mindset, outlook, and approach to tasks and challenges. A positive attitude empowers individuals to approach tasks with enthusiasm, persistence, and confidence, leading to better effort and a higher likelihood of achieving excellence.

Mathematics, often perceived as a challenging subject, can evoke fear or dislike among students. This study aims to create a supportive and enjoyable learning environment to make mathematics more approachable. Vedic mathematics, with its simplified techniques and methods, helps students understand concepts more easily and reduces anxiety associated with learning the subject. By integrating Vedic mathematics-based instruction, this study seeks to cultivate a positive attitude toward learning mathematics, enabling students to engage with the subject fearlessly and with greater confidence.

Limitation of the study:

The following limitations constrain the generalizability of the findings:

- The study was conducted with a sample restricted to the Gudalur region.
- The sample size was limited to 160 participants.
- Only eighth-grade students from primary schools were included in the study.

Analysis:

Hypothesis 1

Vedic mathematics-based instruction does not significantly impact the attitude toward learning mathematics among students in the control and experimental groups, analysed separately for girls and boys.

The investigator has extended the analysis to know whether the method was effective for female or male students separately and so an independent sample t-test was conducted. The result of the statistical analysis is presented in Table 2.

Table 2

Test of Significance of Difference in the Mean Post-test Scores of Attitude Test of Control and Experimental Group for the subsample Gender

	Variable	Group	*n*	*M*	*SD*		*p*
Girls	Attitude	Control	49	100.04	13.21	0.813	0.419
		Experimental	25	102.64	12.62		
Boys	Attitude	Control	31	94.19	10.06	1.500	0.137
		Experimental	55	98.29	13.18		

Note. ** denotes the value is significant at .01 level

n= no. of students, M=Mean, SD = Standard Deviation, t= t value, p = probability

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The *t* value obtained for the test of significance of the difference in the post-test score of attitude towards learning mathematics of the control group (M=100.04; SD =13.21) and experimental group (M=102.64, SD = 12.62) is 0.813 which is less than the table value and hence can be said that the difference is not significant at .05 level of significance.

From the table, it is also clear that the test of significance of the difference in the post-test score attitude of the control group and experimental group for boys gives a t value of 1.500 which is less than 1.96, hence the difference is not significant at a .05 level of significance.

Discussion. The result obtained for the test of significance of the difference in the mean post-test score of attitude towards learning mathematics of both girls and boys shows no significant difference. Hence it can be concluded that the applied Vedic method did not make any enhancement to the attitude of VIII-grade students towards mathematics. Therefore hypothesis 1 is accepted.

Hypothesis 2

There is no significant difference in the mean post-test scores of attitude toward learning mathematics between boys and girls in the control and experimental groups, analyzed separately.

The researcher tried to know the difference in the mean post-test score of the attitude of the control group and experimental group separately in terms of their gender. The independent sample applied gave the stipulated result and is presented in Table 3.

Table 3

Test of Significance of Difference in the Mean Post-test Scores of Attitude Test of Control and Experimental Group students based on gender

Variable	Group	Sub sample	*n*	*M*	*SD*	*t*	*p*
Attitude	Control	Girls	49	100.04	13.21	2.107*	0.038
		Boys	31	94.19	10.06		
Attitude	Experimental	Girls	25	102.64	12.62	1.386	0.169
		Boys	55	98.29	13.18		

The *t* value for the test of significance of the difference in the post-test attitude score of girls (M = 100.04, SD = 13.21) and boys (M = 94.19, SD = 10.06) of the control group is recorded as 2.107. As the obtained t value is greater than the table value 1.96 at a .05 level, it can be said that the difference is significant at a .05 level of significance. It can also be concluded that the post-test attitude score of girls is significantly higher than boys.

Meanwhile, the post-test attitude mean score of girls and boys marks no significant difference as the test gives a critical ratio of 1.386 with a p-value of 0.169. As the *p-value* is greater than 0.05, it can be undoubtedly said that the difference in the post-test attitude score is not significant at a .05 level of significance.

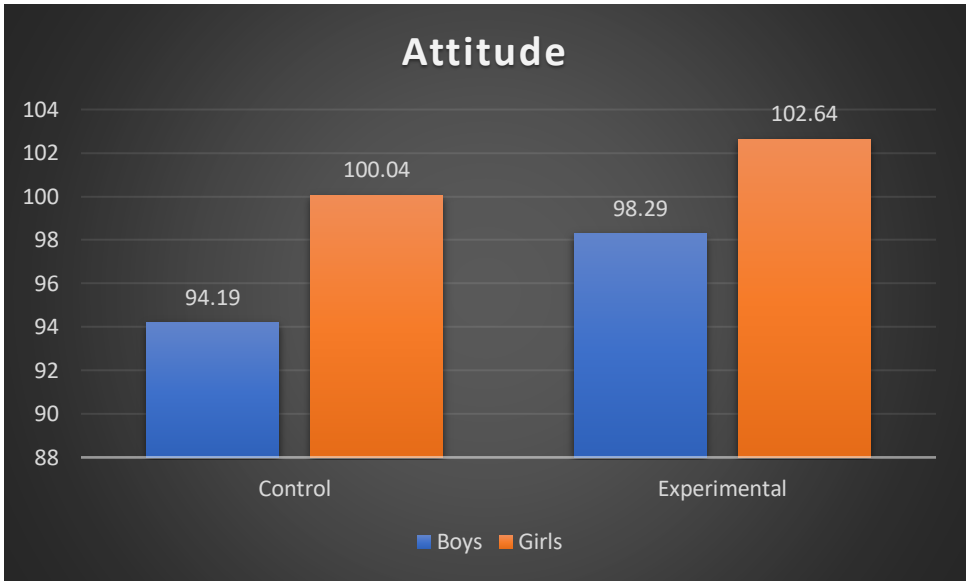

Figure 1: The difference in the mean score of attitude

Findings of the study:

1. The Vedic method, applied to the boys and girls of the experiment group, has a positive effect on their attitude toward mathematics.
2. It is found that the attitude of boys in the experimental group is better than that of girls.
3. The mean post-test score of control group girls is significantly higher than those of the boys.
4. Girls demonstrated a more favourable attitude compared to boys in the control group.
5. The intervention in the experimental group led to comparable outcomes in attitudes for both genders, levelling any initial disparities.

Conclusion:

This study aimed to investigate the impact of incorporating ancient Vedic mathematics-based learning on student attitudes toward mathematics. The findings suggest that the experimental intervention has the potential to foster a more positive attitude toward learning mathematics and reduce gender-based disparities in attitudes.

The results highlight the importance of introducing Vedic mathematics strategies at earlier stages in school curricula rather than delaying their implementation until higher grades. This approach can help create a more enjoyable and effective learning environment. Furthermore, the study encourages educators to explore Vedic mathematics techniques to simplify mathematical concepts, alleviate student anxiety, and promote a positive and engaging learning experience.

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