Research Paper

Attitude Towards Mathematics Among Kerala Students

Saheera T K[1]*

ABSTRACT

This paper aims to understand how certain different but interrelated variables such as sex, type of school (Government/Private), medium of school and urban or rural area of school could lead to an explanation of student attitude towards mathematics. Participants consisted of 61 Kerala students, from fifth to seventh grade. ATMI is used to understand the individual difference about attitude towards mathematics. The result revealed that, in general, boys has more positive attitude toward math's than girls. private school students have more positive attitude towards mathematics than government or aided school students. English medium students have more positive attitude towards mathematics than Malayalam medium students. Rural area students have more positive attitude towards mathematics than urban area students.

Keywords: *ATMI, Individual Difference*

The knowledge of mathematics is an essential tool in our society. It is a tool that can be used in our daily life to overcome the difficulties faced. Due to this mathematics has been considered as one of the most important core subjects in a school curriculum. Students' attitude towards mathematics has been a factor that is known to influence students' achievement in mathematics. Zan and Martino (2007) defined attitude towards mathematics as a positive or negative emotional disposition towards mathematics. The purpose of this study is to find out the student's attitude towards mathematics. Which include think, feel, perceive and behave towards mathematics. The data was collected from 61 students of government and private schools in Mannarkkad, Palakkad, Kerala, India. Popular attitude scales with established psychometric properties were used to measure attitude towards mathematics. In this study ATMI developed by Tapia & Marsh (2004) was used for data collection. The Attitude Toward Mathematics Inventory (ATMI) (Tapia & Marsh, 2004) consists of 40 items that measured four factors, namely enjoyment, general motivation, self-confidence and value, used for this study. Scoring was done with a five-point Likert Scale, with response options from "strongly disagree" to "strongly agree". I prepare a questionnaire using this ATMI in Google form to collect data from the students. The main aim of this study is to find out the individual difference in attitude towards mathematics.

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[1]Assistant Professor, Department of Statistics, M E S Kalladi College, Mannarkkad, Palakkad, Kerala, India
*Corresponding Author

METHODOLOGY

The Attitudes toward Mathematics Inventory (ATMI) was originally developed by Tapia and Martha (1996) in English. The inventory comprises of 49 items and constructed to cover six domains related to attitudes towards mathematics. These are confidence, anxiety, value, enjoyment, motivation and parent/teacher expectations. The items were constructed using Likert-scale format and the students respond to the statement in five-point scale ranging from strongly agree (E), agree (D), neutral (C), disagree (B) and strongly disagree (A). Out of 49 questions, 12 items have negative wordings. According to the developers, these domains were considered due to the previous studies that reported as important factors. The final version of the ATMI comprises 40 items with four subscales, namely, self-confidence (15 items), value (10 items), Enjoyment (10 items) and Motivation (5 items). Out of 40, 11 items are negative wording.

An example of an item from the self-confidence scale is "I believe I am good at solving math problems", an example of an item from the value of mathematics scale is "A strong math background could help me in my professional life". An example from the Enjoyment scale is "I am happier in a math class than in any other class. Also, an example of the motivation scale is "I am willing to take more than the required amount of mathematics.'
The scoring method (positive statement) is given by
Strongly Agree- 5marks, Agree-4mark, Neutral - 3 mark, Disagree - 2 mark, Strongly Disagree – 1 mark

And for a negative statement, the scoring method is revised. The higher or lower ATMI score indicates a more positive or more negative attitude toward mathematics vice versa.

Analysis
Some of the students of 5,6 and 7 standards studying in different secondary schools of Mannarkkad, Palakkad district of Kerala constitute the population of the study. Data from 61 students, which includes Males, Females; Rural, Urban; Private, Government, aided; English medium, Malayalam medium are collected. The data was checked and arranged with the use of spreadsheet in MS Word. The data was analyzed using frequency tables and percentages in line with the themes and the objectives of the study. The objectives of the study were; to determine the attitudes of students towards mathematics as a subject; to investigate the factors influencing the attitudes; to examine the effects of attitudes on achievements and to suggest corrective measures that can help learners to improve in mathematics performance. The study sought to determine the perception of students towards mathematics as a subject whether favorable or not favorable. The items from the questionnaires were summarized with learner responses as Strongly agree, agree, neutral, disagree and strongly disagree. The attitude test results obtained from the study are summarized in Table 1.

DISTRIBUTION OF THE RESPONDED STUDENTS
Total students=61, (G/A – Government/Aided School, P – Private School)

CLASS	MALE								FEMALE							
	ENGLISH				MALAYALAM				ENGLISH				MALAYALAM			
	URBAN		RURAL		URBAN		RURAL		URBAN		RURAL		URBAN		RURAL	
	G/A	P	G/A	P	G/A	P	G/A	P	G/A	P	G/A	P	G/A	P	G/A	P
5th	0	0	1 0	0	0	0	1		1	3	0 0		6	0	1 0	
6th	2	0	0	1	4	0	3	0	0	1	0	1	5	0	2	0
7th	1	0 2	0 0	1	4	0	0		0	1 1	3		8	0	8 0	

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Table 1 Ascending order of ATMI score in % obtained by the student is given by

SL NO:	Name of the Student:	Total ATMI	% of ATMI	Mean ATMI	SL NO:	Name of the Student:	Total ATMI	% Of ATMI	Mean ATMI
1	FathimaTK	94	47	2.35	32	Zamil	137	68.5	3.425
2	FadiyaTK	95	47.5	2.375	33	Rizana	137	68.5	3.425
3	Shana shoukath	97	48.5	2.425	34	Fathima Faiha tk	138	69	3.45
4	Ameena	109	54.5	2.725	35	Zamil	139	69.5	3.475
5	FayisTK	110	55	2.75	36	Fathima Hanna Tk	139	69.5	3.475
6	FarisTK	111	55.5	2.775	37	Ayisha fidha k	140	70	3.5
7	Najeeba P	111	55.5	2.775	38	Umarul farooq	141	70.5	3.525
8	Shanoop PM	112	56	2.8	39	Sudheesh P	142	71	3.55
9	Sumalatha p	113	56.5	2.825	40	Hamna	143	71.5	3.575
10	FarisaTK	114	57	2.85	41	Haris	145	72.5	3.625
11	Umarul Farooq	115	57.5	2.875	42	Janna Fathima O	147	73.5	3.675
12	Shanija PM	117	58.5	2.925	43	Fathima Haniyya M	150	75	3.75
13	Sajna	118	59	2.95	44	Shareena	150	75	3.75
14	Farsana	120	60	3	45	Sabeel	151	75.5	3.775
15	Hasna	121	60.5	3.025	46	Abdulla	155	77.5	3.875
16	Haseeb	122	61	3.05	47	Janiya	155	77.5	3.875
17	Rushdha	123	61.5	3.075	48	Amna fathima	160	80	4
18	Fidha	124	62	3.1	49	Sithara PM	162	81	4.05
19	Aparna	125	62.5	3.125	50	Ninal	165	82.5	4.125
20	Sajna T	126	63	3.15	51	Shaheela	165	82.5	4.125
21	Shifna	126	63	3.15	52	Najla P	166	83	4.15
22	Adnad	127	63.5	3.175	53	Muhammed adil	169	84.5	4.225
23	FayidaTK	127	63.5	3.175	54	Rushdha Fathima mp	170	85	4.25
24	Ayisha	127	63.5	3.175	55	Shaliya	174	87	4.35
25	Safeela T	130	65	3.25	56	Ayisharya M J	175	87.5	4.375
26	Shibina	130	65	3.25	57	Nithin p	180	90	4.5
27	Fathima Naja tk	131	65.5	3.275	58	FavasTK	185	92.5	4.625
28	Shafeek p	133	66.5	3.325	59	Nidhha M. A	188	94	4.7
29	Mehthab	136	68	3.4	60	Amal	189	94.5	4.725
30	Nijla	136	68	3.4	61	Mehvish c t	192	96	4.8
31	Ismayil Arshaq	137	68.5	3.425					

Table 2

From table 2, Mean ATMI Score= 3.469672. This show that, from the selected student of primary and secondary schools in Mannarkkad, the mean score of attitudes towards math's is 3.47 Hence, the students generally have a positive attitude toward mathematics. The distribution of ATMI score for all student's males and females are presented in table 2. More than 78% the students show ATMI score of three and above and among these, more than 29% display the ATMI score of between 4 and 5. The histogram of ATMI (%) Score for all polled students is presented in figure 1.

Individual difference of ATMI scores:

Frequency table of ATMI (%) Score

ATMI (%)	FREQUENCY
45-50	3
50-55	2
55-60	9
60-65	12
65-70	11
70-75	7
75-80	4
80-85	5
85-90	2
90-95	2
95-100	1
TOTAL	**61**

Table 3
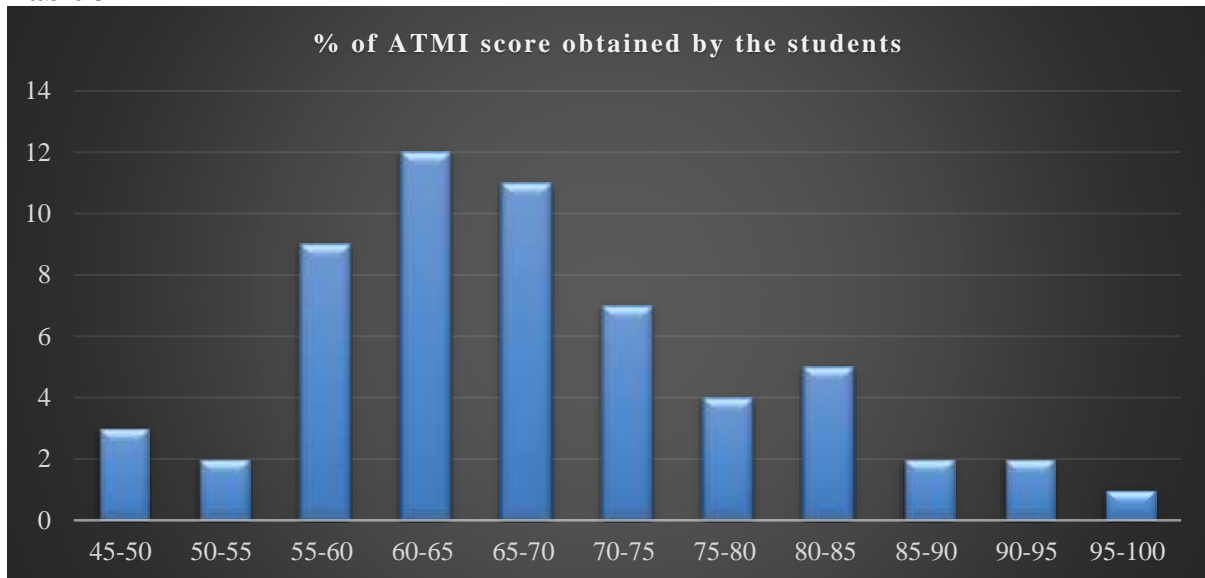
Figure 1

From figure 1, we can see that out of 61 students, 12 students have ATMI (%) scores between 60-65 and 11 students have ATMI score between 65-70. This show that more students have positive attitude towards math's. And also, each individual is different with their ATMI scores. Some students have low ATMI scores and some individual have high ATMI scores.

Individual difference between male and female:

Frequency table of Male and Female

ATMI (%)	F1 (Male)	F2 (Female)
45-50	0	3
50-55	1	1
55-60	3	6
60-65	3	10
65-70	4	7
70-75	3	4
75-80	2	2
80-85	2	4
85-90	0	2
90-95	2	1
95-100	0	1
TOTAL	20	41

Table 4
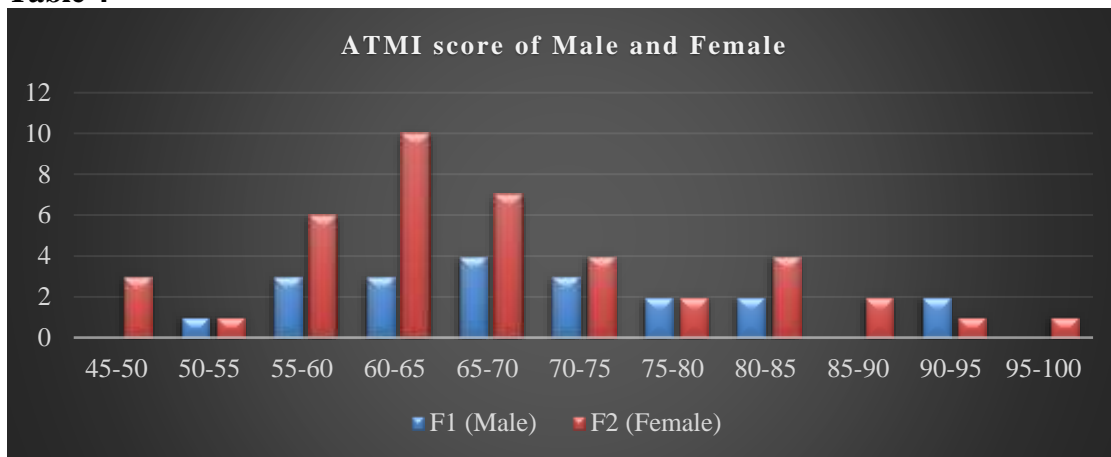
Figure 2

From table 2, The mean ATMI score of males is 3.58125 and female is 3.415244. This shows that male have more attitude towards mathematics than female. From figure 2, we see that male and female get a different % of ATMI score. This means that individual difference towards mathematics exist in both male and female.

Individual difference between Government/Aided and Private school students:

Frequency Table of Government/Aided and Private Schools

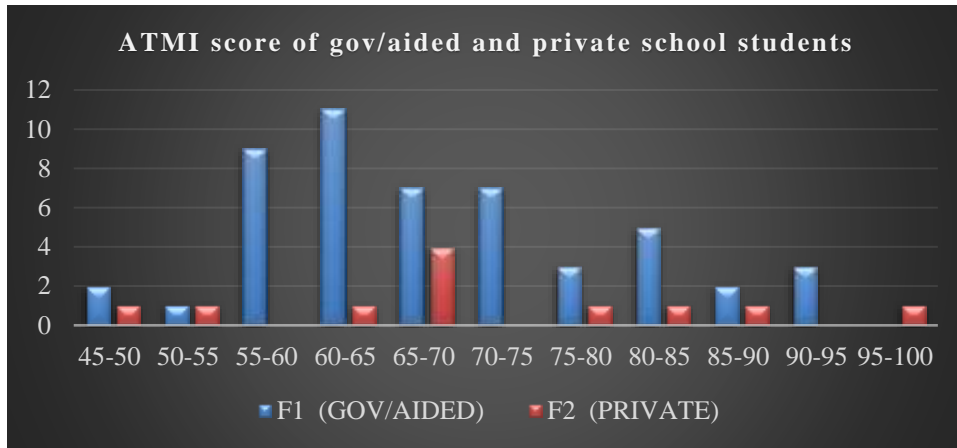| ATMI (%)	F1 (GOV/AIDED)	F2 (PRIVATE)
45-50	2	1
50-55	1	1
55-60	9	0
60-65	11	1
65-70	7	4
70-75	7	0
75-80	3	1
80-85	5	1
85-90	2	1
90-95	3	0
95-100	0	1
TOTAL	50	11

Table 5

Figure 3

Out of 61 students, there are 10 students from private school and remaining 51 students from Government or Aided schools. From table 2, the mean ATMI score of private school students is given by 3.6775 and the Government or Aided school students is given by 3.428922 This show that more attitude towards mathematics is from Government or Aided school students than the private school students. And also figure 3 represents the graph of ATMI score of government /aided and private school students. This shows that ATMI score is different from each student coming from different type of schools. This means that individual difference is exist.

Individual difference between English and Malayalam medium students:

Frequency table of Malayalam and English medium students

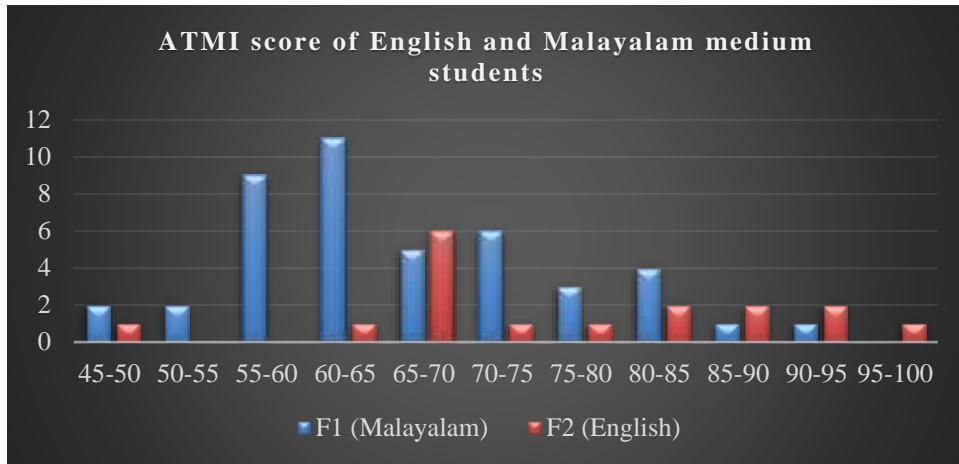| ATMI (%)	F1 (Malayalam)	F2 (English)
45-50	2	1
50-55	2	0
55-60	9	0
60-65	11	1
65-70	5	6
70-75	6	1
75-80	3	1
80-85	4	2
85-90	1	2
90-95	1	2
95-100	0	1
TOTAL	44	17

 Table 6

Figure 4

There are 17 English medium students and 44 Malayalam medium students. From table 2, the mean ATMI score of English medium student is 3.847059 and the Malayalam medium student is 3.323864. This shows that English medium students have more attitude towards mathematics than Malayalam medium students. Figure 4 represents the ATMI score of English medium and Malayalam medium school students. This shows that each individual is different with their ATMI scores.

Individual difference between Rural and Urban area school students:

Frequency table of rural and urban area

ATMI (%)	F1 (Rural)	F2 (Urban)
45-50	0	3
50-55	0	2
55-60	3	6
60-65	3	9
65-70	6	5
70-75	5	2
75-80	4	0
80-85	3	3
85-90	0	3
90-95	1	2
95-100	1	0
TOTAL	26	35

Table 7
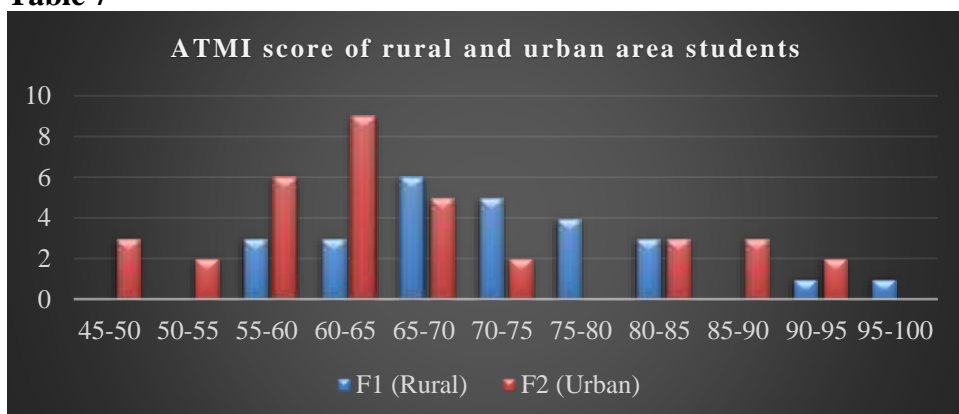
Figure 5

There are 26 students from Rural area and 35 students from Urban area. The mean ATMI score of Rural area school students is 3.626923 and the Urban area school students is 3.352857. This means that Rural area school students have more attitude towards mathematics than Urban area school students. And figure 5 represents the corresponding graph. This shows that each individual of Urban and Rural area is different with their ATMI scores. This means that individual difference exists.

Individual difference between their standards:

Frequency table of student's standards

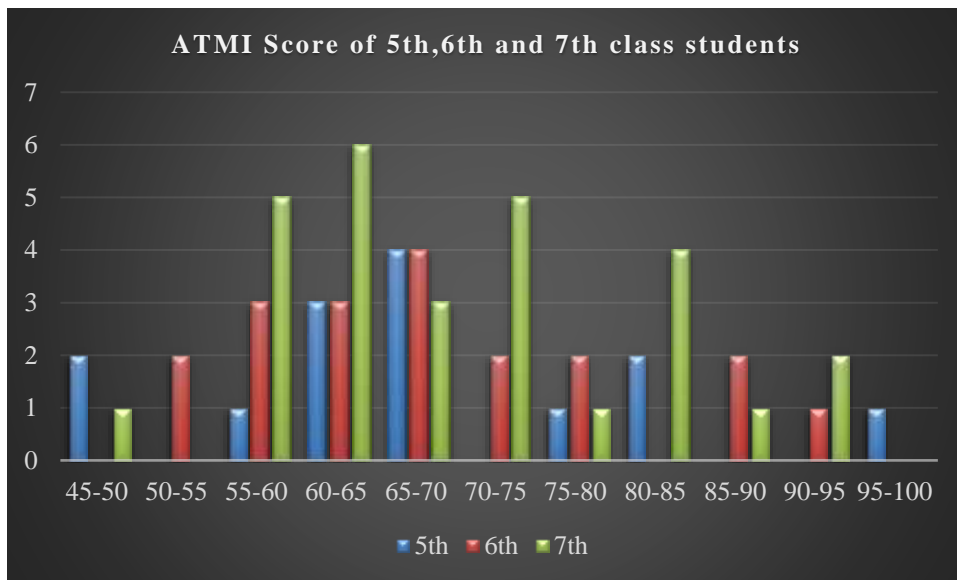| ATMI (%)	5th	6th	7th
45-50	2	0	1
50-55	0	2	0
55-60	1	3	5
60-65	3	3	6
65-70	4	4	3
70-75	0	2	5
75-80	1	2	1
80-85	2	0	4
85-90	0	2	1
90-95	0	1	2
95-100	1	0	0
TOTAL	14	19	28

Table 8

Figure 6

There are 14 fifth class students, 19 sixth class students and 28 seventh class students. The mean ATMI score of fifth class student is 3.396429, sixth class student is 3.459211 and the seventh-class student is 3.513393. This shows that seventh class students have more attitude towards mathematics than sixth and fifth classes. Figure 6 represents the graph of ATMI score of fifth, sixth and seventh class students. This graph shows that each individual is different with their ATMI scores.

SUMMARY AND FINDINGS

- The mean ATMI score of all students is 3.469672. This shows that, from the selected students of primary and secondary schools in Mannarkkad, the mean score of attitudes towards math's is 3.47. Hence, the students generally have a positive attitude towards mathematics.
- The mean ATMI score of males is 3.58125 and female is 3.415244. This shows that male have more positive attitude towards mathematics than female.
- The mean ATMI score of private school students is 3.6775 and government or aided school students is 3.428922. That means private school students have more positive attitude towards mathematics than government or aided school students.
- The mean ATMI score of English medium students is 3.847059 and Malayalam medium students is 3.323864. That means English medium students have more positive attitude towards mathematics than Malayalam medium students.
- The mean ATMI score of rural area students is 3.626923 and the urban area students is 3.352857. Hence, rural area students have more positive attitude towards mathematics than urban area students.
- The mean ATMI score of 5th class students is 3.396429, 6th class students is 3.459211 and the 7th class students is 3.513393. That means, 7th class students have more positive attitude towards mathematics than 6th and 5th class.

From the above data analysis, we can see that students are different with their ATMI score. That means individual difference is exist. The study found that students exhibited a positive attitude towards mathematics.

CONCLUSION

In this study I conclude that individuals are different with attitude towards mathematics. Results showed that, in general, the students had positive attitudes towards mathematics, although scores were not very high and distributed mostly around the midpoint. Learning styles of students are different from each other. The fact that learning styles are different is not a shortcoming but rather a feature that enriches the learning environment. If the student feels ready for self-learning, this is the learning style for the student. Teacher student communication is important at every stage of the education as well as student-student. Lack of student motivation and engagement in academic work is an issue of concern amongst teachers. Since our findings confirm that attitudes are deeply related to motivation and social support, we believe that developing strategies in educational contexts, to improve teacher support and student engagement could be of vital importance in improving not only attitudes but also mathematical performance among students throughout their schooling. It is highly recommended that the maximum effort should be given to improve the students' attitude towards mathematics and conduct further studies to find factors influencing students' attitude towards mathematics. Moreover, studies could be conducted to find if there is a relationship between students' attitude and performance of students in the schools of Mannarkkad.

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