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Analyzing Learners' Reactions And Responses: A Study Of Factors Affecting Pre-Service Teachers' Natural Dispositions In Learning Strands Framework

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Abstract

Whether it is about the experience of excitement or remembering concepts, generating models or using facts or there may be any other area of exploration identified in the learning strand framework, all need analysis of learners' responses and reactions. A teachers attempt to do so may be influenced by many factors. Also, the teachers attempt may not be influenced by some factors. Thus, we can attempt to identify the nature of the factors and the influence they might or might not have. In the present study the teachers have planned their classroom proceedings in the learning strands framework that allows for strengths of informal environments, but with a difference. These have been applied in the formal classroom settings. The study focuses on preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of Qualification Level of the Teacher, Teacher's Area of Expertise and Class Taught by the Teacher. In the study relevant graphs related to this focus have been drawn and interpreted. 'Statistical Descriptives' of the same have also been interpreted as part of the study. The study did not find any significant difference in pre-service teachers' response to "Tried to Analyze Learners' Reactions and Responses" in terms of Qualification Level of the Teacher and Teacher's Area of Expertise. Whereas a difference in pre-service teachers' response to "Tried to Analyze Learners' Reactions and Responses" in terms of Class Taught by the Teacher has been located. Also, the study finds that the strength of association between Tried to Analyze Learners' Reactions and Responses and Class Taught by the Teacher is large. Further, the study hints that the teachers teaching at the lower level are trying to analyze reactions and responses of science learners more than their counterparts at higher levels of schooling in the selected schools. The study contributes towards understanding what factors may affect the teachers' attempt to Analyze Learners' Reactions and Responses.

Keywords: Culture of Science, Learning Strands, Science Classrooms, Pre-Service Teacher Education, Qualification Level of The Teacher, Teacher's Area of Expertise and Class Taught by The Teacher, Learners' Reactions and Responses

Introduction:

(Bell et al., 2009) proposed a "strands of science learning" framework that articulates science-specific capabilities supported by informal environments. It builds on the framework developed for K-8 science learning in Taking Science to School (Duschl et al., 2007). "The six strands illustrate how schools and informal environments can pursue complementary goals and serve as a conceptual tool for organizing and assessing science learning. The six interrelated aspects of science learning covered by the strands reflect the field's commitment to participation—in fact, they describe what participants do cognitively, socially, developmentally, and emotionally in these settings. Learners in informal environments:

Strand 1: Experience excitement, interest, and motivation to learn about phenomena in the natural and physical world.

Strand 2: Come to generate, understand, remember, and use concepts, explanations, arguments, models, and facts related to science.

Strand 3: Manipulate, test, explore, predict, question, observe, and make sense of the natural and physical world.

Strand 4: Reflect on science as a way of knowing; on processes, concepts, and institutions of science; and on their own process of learning about phenomena.

Strand 5: Participate in scientific activities and learning practices with others, using scientific language and tools.

Strand 6: Think about themselves as science learners and develop an identity as someone who knows about, uses, and sometimes contributes to science (Bell et al., 2009)".

There had been an innovative work of applying these informal Learning Strands in Science Classrooms (Kumar, 2014d; Prabha et al., 2013, 2012; Prabha & Kumar, 2014) formally with unit and lesson planning for teaching-learning science.

Need of the study

In the process of applying these informal Learning Strands there had been attempts to develop theoretical context of Alternative Frameworks (Kumar, 2011, 2012a, 2015, 2013a, 2013d, 2013f, 2013g, 2013l, 2013i, 2014m, 2014x) and to undertake Concept specific researches (Kumar, 2013m) on Alternative Framework in Science on Magnets (Kumar, 2014c), Rain (Kumar, 2014u), Soil (Kumar, 2014w), Cells (Kumar, 2014n), Electric Current (Kumar, 2014f), Light (Kumar, 2014o), Blood (Kumar, 2014j), Food (Kumar, 2014l), Mirrors and Lenses (Kumar, 2014s), Universe (Kumar, 2014r), Plant Reproduction (Kumar, 2014t), Sources of Energy (Kumar, 2014v), Air (Kumar, 2014i), Force (Kumar, 2014q), Light (Kumar, 2014o) etc. This had been followed by further research on understanding Natural Dispositions of the engaged teachers in Classroom

Context (Kumar, 2013a) and related Processes (Kumar, 2012b, 2012c, 2014b, 2014e, 2014d, 2014h, 2014g, 2014p, 2014k, 2015, 2013b, 2013c, 2013e, 2013h, 2013j, 2013k, 2013n, 2014a). However, during these attempts there had been some research gaps. One of these were related to the factors affecting 'Tried to Analyze Learners' Reactions and Responses'. The present study attempted to locate and fill that gap.

Whether it is about the experience of excitement or remembering concepts, generating models or using facts or there may be any other area of exploration identified in the learning strand framework, all need analysis of learners' responses and reactions. A teachers attempt to do so may be influenced by many factors. Also, the teachers attempt may not be influenced by some factors. What factors may affect this attempt can be added as our understanding of designing teaching-learning environments. Thus, we can attempt to identify the nature of the factors and the influence they might or might not have.

Research Methodology

Research Questions

Three research questions are framed based on the following three factors viz. Qualification Level of the Teacher, Teacher's Area of Expertise, Class Taught by the Teacher.

1. How do we graphically represent preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors?
2. How do we interpret 'statistical descriptives' related to preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors?
3. What are the differences (if any) in preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors?

Research Objectives

The study has focused on the following objectives:

1. To draw and interpret relevant graphs related to preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors.
2. To interpret the 'statistical descriptives' related to preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors.
3. To locate the differences (if any) in preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of the identified factors.

Methodology, sample and tools:

Methodology:

The study does not attempt to manipulate any variables or find cause and effect relationships. The study can be placed in the descriptive and exploratory framework in education. In the introduction and need part the background of the study has also been explained. On the basis of reflections on different issues and challenges in the area of science education and enriched by assessment of related literature, the researcher experienced some concerns in the area of study related to processes of teaching and learning in science. These concerns were placed specifically in the context of the eighteen schools in which the purposive sample described in the next section was placed. These concerns were converted into questions that needed further probing. These questions were converted into wide-ranging tool consisting of twenty-six items exploring various identified concerns. This tool was used for probing the science classrooms of the sample described in the next section. The researchers used IBM-SPSS for analyzing the data thus collected.

Sample

The identified purposive sample consisted of total 38 Pre-Service Science teachers from two B.Ed. colleges from University of Delhi and GGSIP University, Delhi. Out of these data could be collected from thirty pre-service teachers only. This sample of pre-service teachers had their School Life Experience Program in 18 schools across Delhi. These teachers belonged to diverse graduation and post-graduation subject combination. First the College belonging to University of Delhi there were 8 participants and from GGSIP University college there were 30 participants. Code numbers 1.01 to code number 1.30 were given to 30 Pre-service teachers from First College of Education and code numbers 2.01 to code number 2.08 were given to 8 Pre-Service teachers from Second College of Education. It is evident that the sample is not a random sample. While no deliberate effort was made for the sample to be heterogeneous or representative, it came out to be heterogeneous. We can see this in the characteristic factors that had been described below.it was observed that these pre-service teachers belonged to diverse socio-economic background. The science learners belonged to different sorts of school settings thereby indicating diverse socio-economic background of the learners too. Thus, we can imply that there had been diversity in teaching-learning settings too. During the data collection, feedback responses on 592 lessons delivered by these 30 pre-service science teachers were also received.

The properties of different factors that had been studied in the sample are described below.

Level

		Value	Count	Percent
Standard Attributes	Label	Qualification Level of the Teacher		
	Type	String		
	Measurement	Nominal		
Valid Values	1	Graduate	25	83.3%
	2	Post Graduate	5	16.7%

Expertise				
		Value	Count	Percent
Standard Attributes	Label	Teacher's Area of Expertise		
	Type	String		
	Measurement	Nominal		
Valid Values	1	Physics	1	3.3%
	2	Bio-Technology	2	6.7%
	3	Life-Sciences	8	26.7%
	4	Mathematics	3	10.0%
	5	Physical Sciences	10	33.3%
	6	Chemistry	4	13.3%
	7	Applied Sciences	1	3.3%
	8	Information Technology	1	3.3%

Class				
		Value	Count	Percent
Standard Attributes	Label	Class Taught by the Teacher		
	Type	String		
	Measurement	Nominal		
Valid Values	6	6th Class	13	43.3%
	7	7th Class	8	26.7%
	8	8th Class	8	26.7%
	9	9th Class	1	3.3%

Tools for data collection

In the present study the tool prepared by the researcher and as described in the earlier section was used. In order to triangulate the data observations and unstructured interviews were used. This tool was in the form of self- appraisal consisting of both open ended and close ended questions. The nature of the items in the tool was such that they can be analyzed quantitatively and qualitatively. Field professionals, and colleagues in the teacher education organizations validated the tool prepared.

Analysis of Data

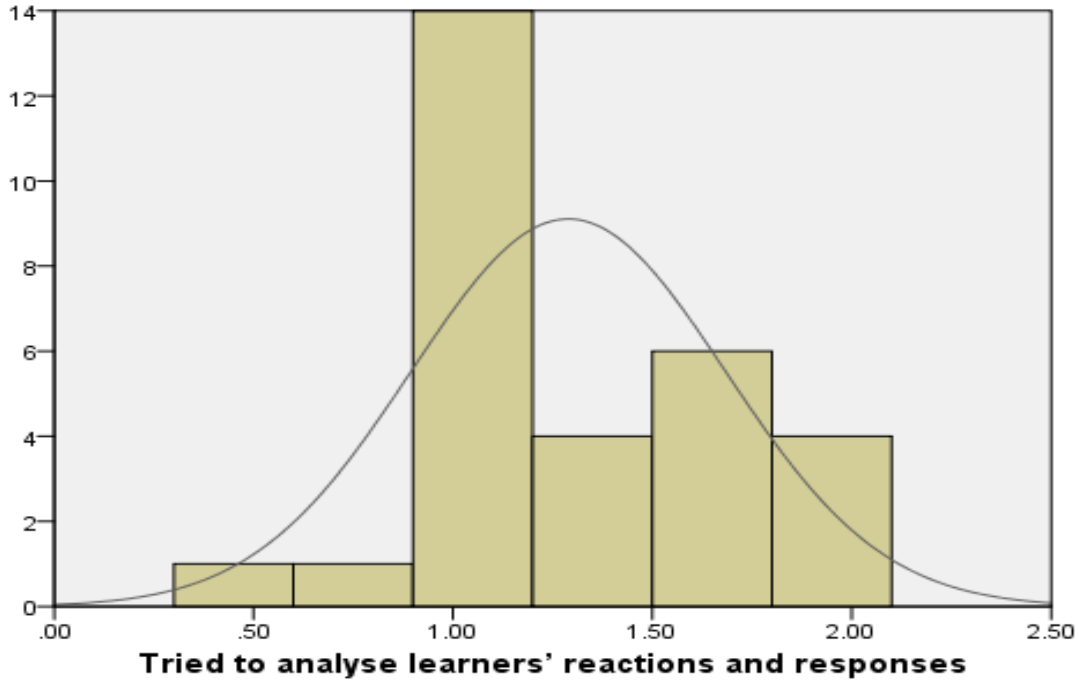
On each of the 26 items, respondents had the choice of answering them in terms of disagree, agree, and strongly agree. These three choices were given the marks zero, one and two respectively for the purposive analysis. From this quantification of responses, the average score of one specific pre-service teacher was obtained. And the average scores of these 30 pre-service teachers were further analysed of their responses on different items in the questionnaire. Out of these items one was related to pre-service teacher's natural disposition towards "Tried to Analyze Learners' Reactions and Responses". Graphs and descriptives from data specific to this response are being given in "findings" part of the study that follows.

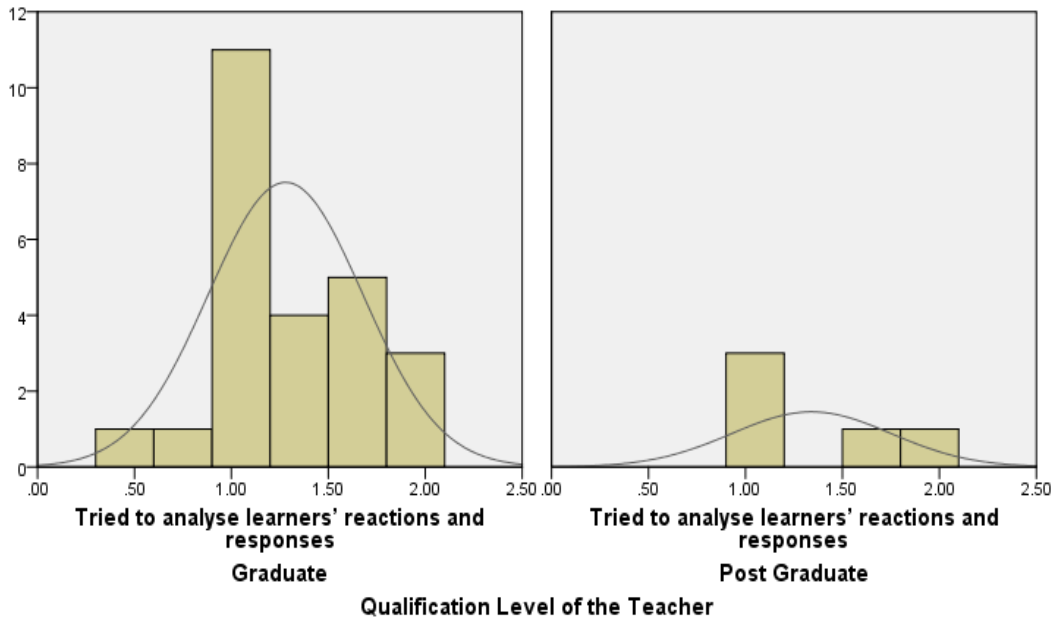
Findings

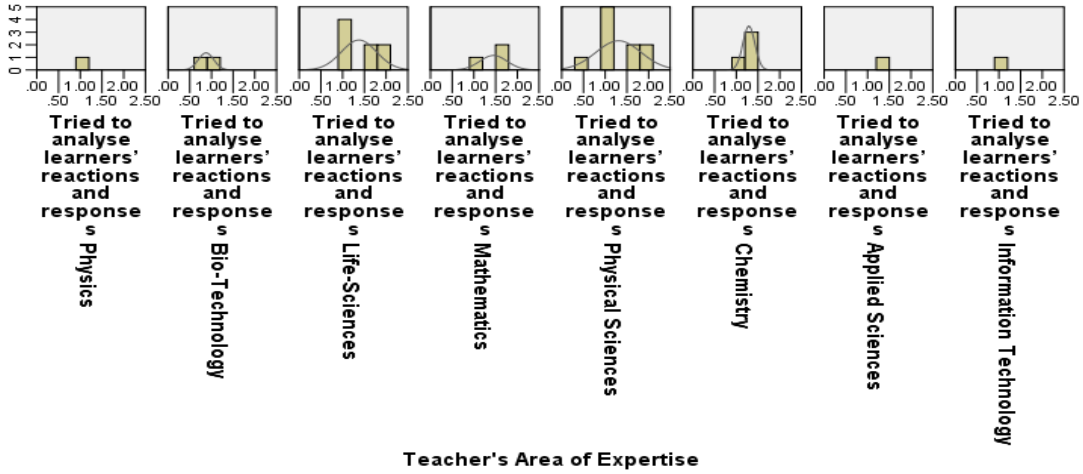
Table 1 shows the average scores of several teachers on the feedback schedule related to the Component "Tried to Analyze Learners' Reactions and Responses" of the teaching-learning environment in damage of Teachers' Self-Assessment. The evaluation, interpretation and appropriate graphical descriptions had been used in the following discussions using the information from the Table 1.

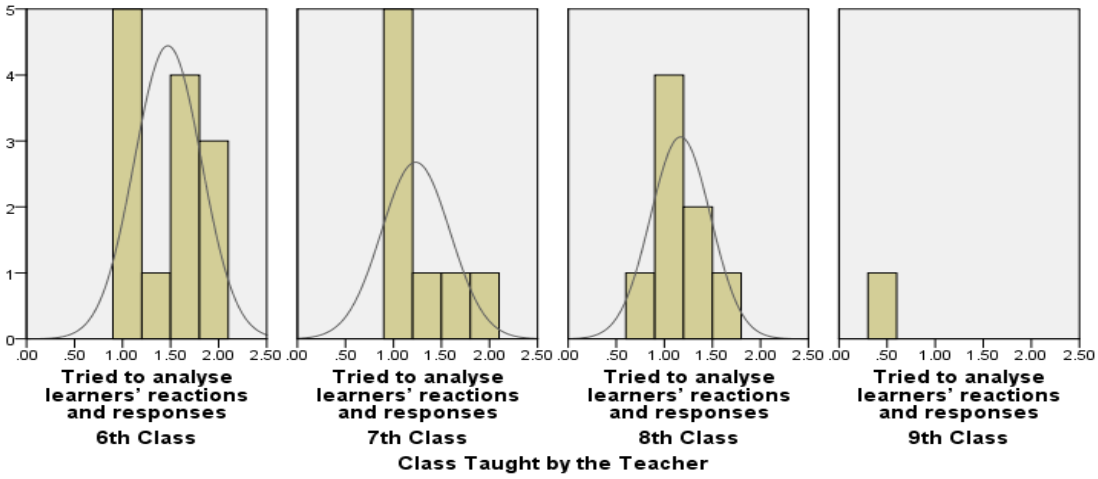
Table 1 - Individual average score of different respondents on the item: Tried to Analyze Learners' Reactions and Responses

Tch. Cd.	Av. Score
103	0.9
109	1.1
114	2
121	1.73
127	0.75
133	1.35
201	1.15
101	1.1
102	1
104	1.9
105	1.2
106	1.7
107	1
108	1.1
11	1.1
111	1.2
112	1.45
113	1.55
117	1.65
118	2
119	1.15
12	1.1
121	1.85
123	1.5
124	1.75
125	1.1
126	1.35
13	1
202	0.9
203	0.35


14
12
10
8
6
4
2
0
.00
.50
1.00
1.50
2.00
2.50
Tried to analyse learners' reactions and responses


12
10
8
6
4
2
0
.00
.50
1.00
1.50
2.00
2.50
Tried to analyse learners' reactions and responses
Graduate
Post Graduate
Qualification Level of the Teacher





Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Tried to analyze learners' reactions and responses * Qualification Level of the Teacher	30	100.0%	0	0.0%	30	100.0%
Tried to analyze learners' reactions and responses * Teacher's Area of Expertise	30	100.0%	0	0.0%	30	100.0%

Tried to analyze learners' reactions and responses * Class Taught by the Teacher	30	100.0%	0	0.0%	30	100.0%

Tried to analyze learners' reactions and responses * Qualification Level of the Teacher

Report								
Tried to analyze learners' reactions and responses								
Qualification Level of the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
Graduate	1.2791	1.1500	.35	2.00	1.65	.39865	.084	.103
Post Graduate	1.3400	1.1500	.90	1.85	.95	.41140	.439	-2.478
Total	1.2892	1.1500	.35	2.00	1.65	.39421	.107	-.159

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Tried to analyze learners' reactions and responses * Qualification Level of the Teacher	Between Groups	(Combined)	.015	1	.015	.096	.759
	Within Groups		4.491	28	.160		
	Total		4.507	29			

Measures of Association		
	Eta	Eta Squared

Tried to analyze learners' reactions and responses * Qualification Level of the Teacher	.059	.003

Tried to analyze learners' reactions and responses * Teacher's Area of Expertise

Report								
Tried to analyze learners' reactions and responses								
Teacher's Area of Expertise	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
Physics	1.1000	1.1000	1.10	1.10	.00	.	.	.
Bio-Technology	.8750	.8750	.75	1.00	.25	.17678	.	.
Life-Sciences	1.3750	1.3250	.90	2.00	1.10	.40356	.473	-1.242
Mathematics	1.4500	1.5500	1.10	1.70	.60	.31225	-1.293	.
Physical Sciences	1.3077	1.1000	.35	2.00	1.65	.51742	-.252	-.435
Chemistry	1.2875	1.2750	1.15	1.45	.30	.13769	.323	-3.033
Applied Sciences	1.3500	1.3500	1.35	1.35	.00	.	.	.
Information Technology	.9000	.9000	.90	.90	.00	.	.	.
Total	1.2892	1.1500	.35	2.00	1.65	.39421	.107	-.159

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Tried to analyze learners' reactions and responses * Teacher's Area of Expertise	Between Groups	(Combined)	.674	7	.096	.553	.785
	Within Groups		3.833	22	.174		
	Total		4.507	29			

Measures of Association		
	Eta	Eta Squared
Tried to analyze learners' reactions and responses * Teacher's Area of Expertise	.387	.150

Tried to analyze learners' reactions and responses * Class Taught by the Teacher

Report								
Tried to analyze learners' reactions and responses								
Class Taught by the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
6th Class	1.4713	1.5000	1.00	2.00	1.00	.35012	.043	-1.573
7th Class	1.2313	1.1000	.90	2.00	1.10	.35751	1.728	2.887
8th Class	1.1688	1.1250	.75	1.75	1.00	.31275	.687	.587
9th Class	.3500	.3500	.35	.35	.00	.	.	.
Total	1.2892	1.1500	.35	2.00	1.65	.39421	.107	-.159

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Tried to analyze learners' reactions and responses * Class Taught by the Teacher	Between Groups	(Combined)	1.456	3	.485	4.138	.016
	Within Groups		3.050	26	.117		
	Total		4.507	29			

Measures of Association		
	Eta	Eta Squared
Tried to analyze learners' reactions and responses * Class Taught by the Teacher	.568	.323

Analysis and Interpretation:

1) The Mean is 1.2892 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.15 which means fifty percent of the cases lie above and below it. The Range for Total teachers taken together is 1.65 for which minimum value is 0.35 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.39421. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.89 and 1.68. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.107. which means that the data is slightly positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -0.159 which shows that the data distribution will be interpreted not outside the range of normality. This is evident in the graphical representation of the data as well.

2(a) The Mean is 1.2791 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.15 which means fifty percent of the cases lie above and below it. The Range for Graduate teachers taken together is 1.65 for which minimum value is 0.35 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.39865. S.D. when interpreted with the calculated means, it implies that most of the teachers scored

between 0.88 and 1.67. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.084. which means that the data is slightly positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is 0.103 which shows that the data distribution will be interpreted not outside the range of normality. This is evident in the graphical representation of the data as well.

2(b) The Mean is 1.34 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.15 which means fifty percent of the cases lie above and below it. The Range for Post Graduate teachers taken together is 0.95 for which minimum value is 0.9 and maximum value is 1.85. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.4114. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.92 and 1.75. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.439. which means that the data is moderately positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -2.478 which shows that the data distribution will be interpreted outside the range of normality. This is evident in the graphical representation of the data as well.

2(c) We test the null-hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Qualification Level of the Teacher the value of the F-ratio comes out to be 0.096 and the p-value comes out to be 0.759 through ANOVA. The interpretation of the p-value reveals that it is more than the alpha level i.e., 0.05 which means that we retain the null hypothesis. The interpretation of the F-ratio reveals that it is less than the critical value 4.196 which means that we retain the null hypothesis. On the basis of this interpretation, we retain the null hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Qualification Level of the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.003 as shown in the table. As we retain the null- hypothesis the strength of association between Tried to Analyze Learners' Reactions and Responses * Qualification Level of the Teacher is considered insignificant.

3(a) The Mean is 1.1 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.1 which means fifty percent of the cases lie above and below it. The Range for Physics teachers taken together is 0 for which minimum value is 1.1 and maximum value is 1.1. This shows no difference between minimum and maximum values. This difference can be interpretated as no divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and

Responses. Standard deviation is incalculable. Skewness is incalculable. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(b) The Mean is 0.875 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 0.875 which means fifty percent of the cases lie above and below it. The Range for Bio-Technology teachers taken together is 0.25 for which minimum value is 0.75 and maximum value is 1. This shows low difference between minimum and maximum values. This difference can be interpretated as low divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.17678. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.69 and 1.05. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is incalculable. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(c) The Mean is 1.375 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.325 which means fifty percent of the cases lie above and below it. The Range for Life-Sciences teachers taken together is 1.1 for which minimum value is 0.9 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.40356. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.97 and 1.77. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.473. which means that the data is moderately positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -1.242 which shows that the data distribution will be interpreted outside the range of normality. This is evident in the graphical representation of the data as well.

3(d) The Mean is 1.45 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.55 which means fifty percent of the cases lie above and below it. The Range for Mathematics teachers taken together is 0.6 for which minimum value is 1.1 and maximum value is 1.7. This shows low difference between minimum and maximum values. This difference can be interpretated as low divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.31225. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.13 and 1.76. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is -1.293. which means that the data is highly negatively skewed. i.e., the number of low scorers is greater than the high

scorers on the question of Tried to Analyze Learners' Reactions and Responses. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(e) The Mean is 1.3077 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.1 which means fifty percent of the cases lie above and below it. The Range for Physical Sciences teachers taken together is 1.65 for which minimum value is 0.35 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.51742. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.79 and 1.82. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is -0.252. which means that the data is slightly negatively skewed. i.e., the number of low scorers is greater than the high scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -0.435 which shows that the data distribution will be interpreted not outside the range of normality. This is evident in the graphical representation of the data as well.

3(f) The Mean is 1.2875 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.275 which means fifty percent of the cases lie above and below it. The Range for Chemistry teachers taken together is 0.3 for which minimum value is 1.15 and maximum value is 1.45. This shows low difference between minimum and maximum values. This difference can be interpretated as low divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.13769. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.15 and 1.42. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.323. which means that the data is slightly positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -3.033 which shows that the data distribution will be interpreted outside the range of normality. This is evident in the graphical representation of the data as well.

3(g) The Mean is 1.35 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.35 which means fifty percent of the cases lie above and below it. The Range for Applied Sciences teachers taken together is 0 for which minimum value is 1.35 and maximum value is 1.35. This shows no difference between minimum and maximum values. This difference can be interpretated as no divergence in the mean scores on the response towards Tried to Analyze Learners'

Reactions and Responses. Standard deviation is incalculable. Skewness is incalculable. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(h) The Mean is 0.9 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 0.9 which means fifty percent of the cases lie above and below it. The Range for Information Technology teachers taken together is 0 for which minimum value is 0.9 and maximum value is 0.9. This shows no difference between minimum and maximum values. This difference can be interpretated as no divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is incalculable. Skewness is incalculable. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(i) We test the null-hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Teacher's Area of Expertise the value of the F-ratio comes out to be 0.553 and the p-value comes out to be 0.785 through ANOVA. The interpretation of the p-value reveals that it is more than the alpha level i.e., 0.05 which means that we retain the null hypothesis. The interpretation of the F-ratio reveals that it is less than the critical value 2.464 which means that we retain the null hypothesis. On the basis of this interpretation, we retain the null hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Teacher's Area of Expertise as a conclusion of this interpretation. The value of eta-squared is 0.150 as shown in the table. As we retain the null- hypothesis the strength of association between Tried to Analyze Learners' Reactions and Responses * Teacher's Area of Expertise is considered insignificant.

4(a) The Mean is 1.4713 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.5 which means fifty percent of the cases lie above and below it. The Range for 6th Class teachers taken together is 1 for which minimum value is 1 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.35012. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.12 and 1.82. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.043. which means that the data is slightly positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is -1.573 which shows that the data distribution will be interpreted outside the range of normality. This is evident in the graphical representation of the data as well.

4(b) The Mean is 1.2313 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.1 which means fifty percent of the cases lie above and below it. The Range for 7th Class teachers taken together is 1.1

for which minimum value is 0.9 and maximum value is 2. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.35751. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.87 and 1.58. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 1.728. which means that the data is highly positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is 2.887 which shows that the data distribution will be interpreted outside the range of normality. This is evident in the graphical representation of the data as well.

4(c) The Mean is 1.1688 which means on an average most teachers agree on Tried to Analyze Learners' Reactions and Responses. The Median is 1.125 which means fifty percent of the cases lie above and below it. The Range for 8th Class teachers taken together is 1 for which minimum value is 0.75 and maximum value is 1.75. This shows high difference between minimum and maximum values. This difference can be interpretated as high divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is 0.31275. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.85 and 1.48. This means, on an average most of the teachers agree on Tried to Analyze Learners' Reactions and Responses and some strongly agree with it. Skewness is 0.687. which means that the data is moderately positively skewed. i.e., the number of high scorers is greater than the low scorers on the question of Tried to Analyze Learners' Reactions and Responses. This is evident in the graphical representation of the data as well. Kurtosis is 0.587 which shows that the data distribution will be interpreted not outside the range of normality. This is evident in the graphical representation of the data as well.

4(d) The Mean is 0.35 which means on an average most teachers disagree on Tried to Analyze Learners' Reactions and Responses. The Median is 0.35 which means fifty percent of the cases lie above and below it. The Range for 9th Class teachers taken together is 0 for which minimum value is 0.35 and maximum value is 0.35. This shows no difference between minimum and maximum values. This difference can be interpretated as no divergence in the mean scores on the response towards Tried to Analyze Learners' Reactions and Responses. Standard deviation is incalculable. Skewness is incalculable. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

4(e) We test the null-hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Class Taught by the Teacher the value of the F-ratio comes out to be 4.138 and the p-value comes out to be 0.016 through ANOVA. The interpretation of the p-value reveals that it is less than the alpha level i.e., 0.05 which means that we reject the null

hypothesis. The interpretation of the F-ratio reveals that it is more than the critical value 2.975 which means that we reject the null hypothesis. On the basis of this interpretation, we reject the null hypothesis for the relation Tried to Analyze Learners' Reactions and Responses * Class Taught by the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.323 as shown in the table. As we reject the null-hypothesis the strength of association between Tried to Analyze Learners' Reactions and Responses * Class Taught by the Teacher indicates a large effect.

Conclusion:

The study focuses on preservice teacher's natural dispositions towards "Tried to Analyze Learners' Reactions and Responses" in terms of Qualification Level of the Teacher, Teacher's Area of Expertise and Class Taught by the Teacher In the study relevant graphs related to this focus have been drawn and interpreted. 'Statistical Descriptives' of the same have also been interpreted as part of the study. The study did not find any significant difference in pre-service teachers' response to "Tried to Analyze Learners' Reactions and Responses" in terms of Qualification Level of the Teacher and Teacher's Area of Expertise. Whereas a difference in pre-service teachers' response to "Tried to Analyze Learners' Reactions and Responses" in terms of Class Taught by the Teacher has been located also the study finds that the strength of association between Tried to Analyze Learners' Reactions and Responses and Class Taught by the Teacher is large. Further, the study hints that the teachers teaching at the lower level are trying to analyze reactions and responses of science learners more than their counterparts at higher levels of schooling in the selected schools.

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