

Practicing Revisionary NoS by Withholding Own Ideas and Conclusions Effectively

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Abstract

Nature of Science tells us about the tentative and revisionary processes and knowledge in the scientific domains. The science classrooms on the contrary keep on proliferating the fixed notions of science in fixed design-based teaching-learning environments. One of the greatest challenges by the teachers observed is related with their own believes in the fixed ideas in science. This has a direct bearing on the way science classrooms are conducted and managed. It is even difficult to imagine the framework that can be specifically used in science learning contexts. One such framework was developed as learning strands and was designed for the informal environments. In the current study the teachers have planned their classroom processes in a framework that allows for strengths of informal environments to be used in formal classroom settings. The study focuses on preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" 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 "Withheld Own Ideas and Conclusions Effectively" in terms of Qualification Level of the Teacher and Teacher's Area of Expertise. Whereas a difference in pre-service teachers' response to "Withheld Own Ideas and Conclusions Effectively" in terms of Class Taught by the Teacher has been located. Also, the study finds that the strength of association between Withheld Own Ideas and Conclusions Effectively and Class Taught by the Teacher is large. Further, the study hints that the teachers teaching at the lower level are withholding own ideas and conclusions effectively for science learners more than their counterparts at higher levels of schooling in the selected schools.

Key Words: learning strands, Science classrooms, Pre-service Teacher Education, Qualification Level of the Teacher, Teacher's Area of Expertise, Class Taught by the Teacher, Withholding own ideas and conclusions

Introduction:

Nature of Science tells us about the tentative and revisionary processes and knowledge in the scientific domains. The science classrooms on the contrary keep on proliferating the fixed notions of science in fixed design-based teaching-learning environments. One of the greatest challenges by the teachers observed is related with their own believes in the fixed ideas in science. This has a direct bearing on the way science classrooms are conducted and managed. It is even difficult to imagine the framework that can be specifically used in science learning contexts. One such framework was developed as learning strands and was designed for the informal environments. There had been an innovative application of informal Learning Strands in Science Classrooms (Kumar, 2014n; Prabha, Jha, & Kumar, 2012; Prabha, Kumar, & Jha, 2013; Prabha & Kumar, 2014) formally with unit and lesson planning for teaching-learning science. In the process there had been attempts to develop theoretical context of Alternative Frameworks (Kumar, 2011, 2012c, 2015, 2013k, 2013g, 2013h, 2013n, 2013a, 2013i, 2014m, 2014k) and to undertake Concept specific researches (Kumar, 2013b) on Alternative Framework in Science on Magnets (Kumar, 2014r), rain (Kumar, 2014q), soil (Kumar, 2014h), cells (Kumar, 2014u), Electric Current (Kumar, 2014c), light (Kumar, 2014v), blood (Kumar, 2014x), Food (Kumar, 2014e), Mirrors and Lenses (Kumar, 2014j), Universe (Kumar, 2014s), Plant Reproduction (Kumar, 2014p), Sources of Energy (Kumar, 2014b), Air (Kumar, 2014o), Force (Kumar, 2014i), Light (Kumar, 2014v) 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, 2012a, 2014d, 2014g, 2014l, 2014a, 2014f, 2014t, 2014n, 2015, 2013l, 2013e, 2013j, 2013d, 2013f, 2013m, 2013c, 2014w). During the above cited efforts there had been a research gap on the issues affecting Withholding of Own Ideas and Conclusions Effectively by the teachers teaching science. The present study is an effort to fill that gap.

Research Methodology**Research Questions**

The following questions are focused on the three identified 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 "Withheld Own Ideas and Conclusions Effectively" in terms of the three identified factors?
2. How do we interpret 'statistical descriptives' related to preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" in terms of the three identified factors?
3. What are the differences (if any) in preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" in terms of the three 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 "Withheld Own Ideas and Conclusions Effectively" in terms of the three identified factors.
2. To interpret the 'statistical descriptives' related to preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" in terms of the three identified factors.
3. To locate the differences (if any) in preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" in terms of the three identified factors.

Methodology, sample and tools:

Reflecting on processes of teaching and learning in science the researcher developed some thoughts in the area of study bringing about some questions that needed further probing. The researcher developed a wide-ranging tool probe these questions. The researchers used IBM-SPSS for exploring the questions and objectives identified.

Total 38 Pre-Service Science teachers from University of Delhi and GGSIP University, Delhi from total 18 schools participated from two B.Ed. colleges. They were undergoing their School Life Experience Program as Pre-Service teachers. These belonged to different graduation and post-graduation subjects. First College had 8 participants. Second college had 30 participant Teachers. Feedback responses from 592 lessons delivered were received from 30 pre-service science teachers from them. Out of total 38 Pre-Service teachers, code numbers 1.01 to code number 1.30 were given to 30 Pre-service teachers from First College of Education and 8 Pre-Service teachers from Second College of Education received code numbers 2.01 to code number 2.08.

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%

In the present study questionnaire prepared by the researcher was used along with observations and unstructured interviews to triangulate the data. Field experts, and colleagues in the teacher education institutions validated the tool prepared.

Analysis of Data

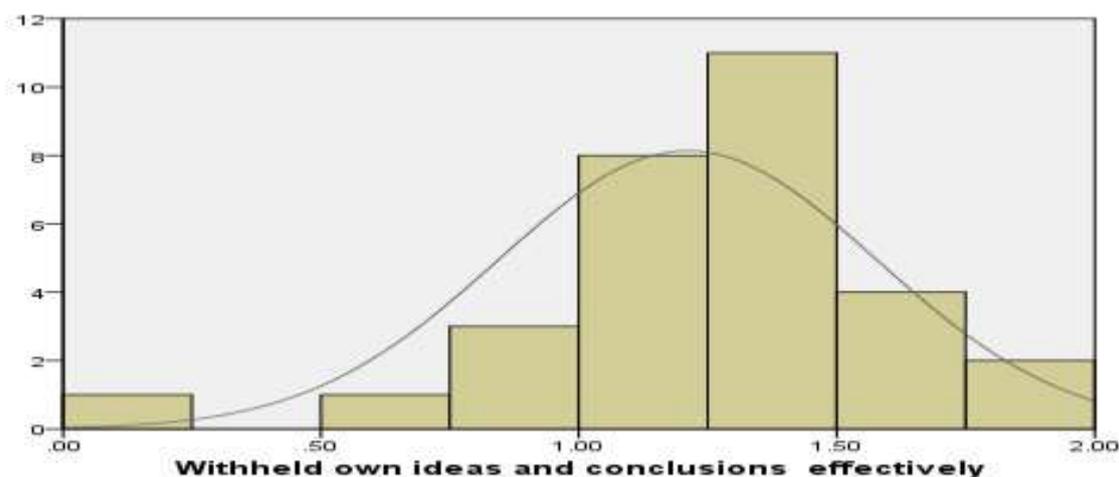
The schedule of self-assessment response, actually contained 26 items, and also had the choice of answering in terms of disagree, agree, and strongly agree. These three categories of choices are further given the marks of zero, one and two respectively. These responses in the form of marks of zero, one and two were provided as the feedback to the science teachers from the analysis. Also, these responses were then collected on the Microsoft Excel sheet for the duration of overall school time interaction program of all the participating pre-service science teachers. Thus, the average score of one specific teacher was obtained. And the average scores of these 30 teachers were entered in separate Excel sheet for further analysis of their responses on the items in the questionnaire. Graphs and descriptives from this data are being given in “findings” part of the study that follows.

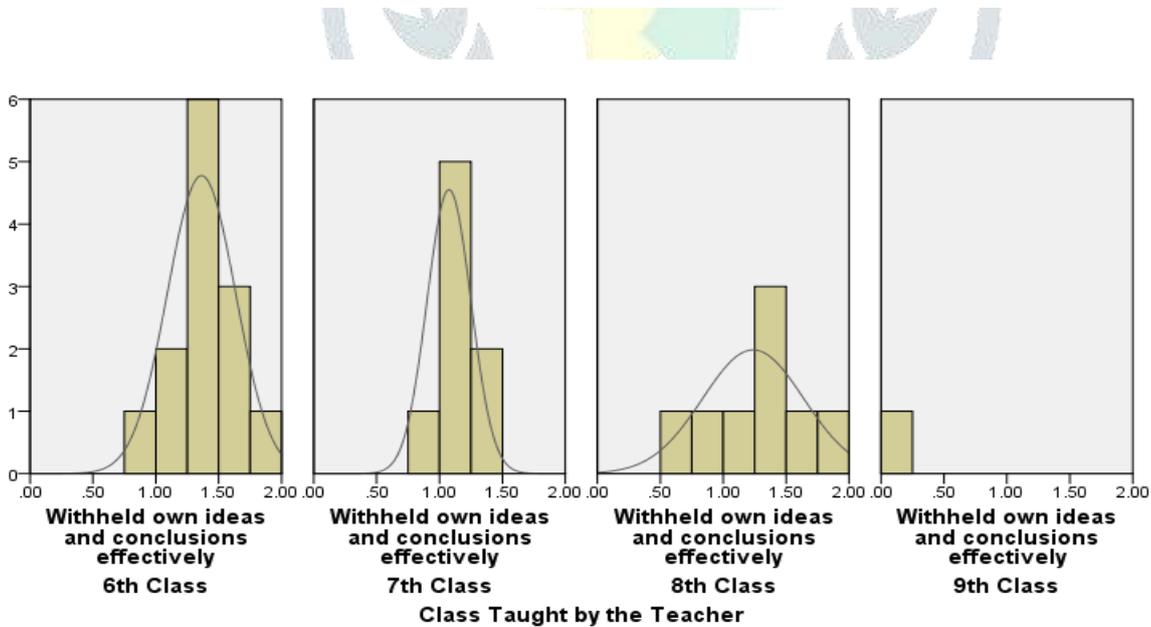
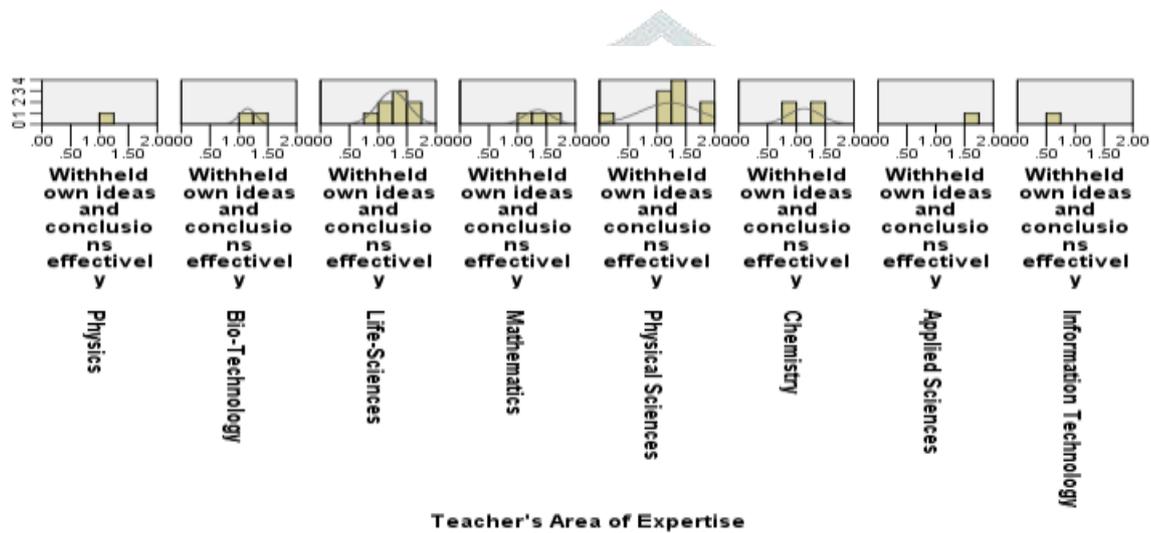
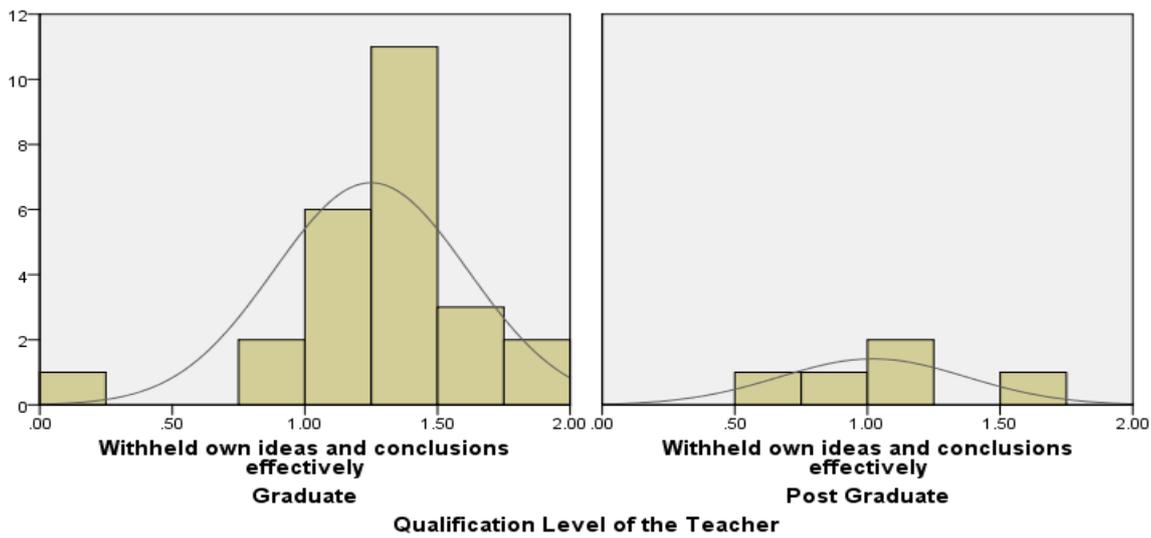
Findings

Table 1 shows the average scores of several teachers on the feedback schedule related to the Component “Withheld Own Ideas and Conclusions Effectively” 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: Withheld Own Ideas and Conclusions Effectively

Tch. Cd.	Av. Score
103	0.8
109	1.3
114	1
122	1.32
127	1.25
128	1.5
201	0.85
101	1.05
102	1.05
104	1.4
105	1.35
106	1.15
107	1.05
108	1.05
11	1.3
111	1.3
112	1.45
113	1.6
117	1
118	1.9
119	1.2
12	1.25
121	1.5
123	1.65
124	1.95
125	1.25
126	0.95
13	1.25
202	0.55
203	0.1





Case Processing Summary						
	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Withheld own ideas and conclusions effectively * Qualification Level of the Teacher	30	100.0%	0	0.0%	30	100.0%
Withheld own ideas and conclusions effectively * Teacher's Area of Expertise	30	100.0%	0	0.0%	30	100.0%
Withheld own ideas and conclusions effectively * Class Taught by the Teacher	30	100.0%	0	0.0%	30	100.0%

Withheld own ideas and conclusions effectively * Qualification Level of the Teacher

Report									
Withheld own ideas and conclusions effectively									
Qualification Level of the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis	
Graduate	1.2487	1.2500	.10	1.95	1.85	.36541	-.862	3.404	
Post Graduate	1.0200	1.0500	.55	1.50	.95	.35285	.039	.307	
Total	1.2106	1.2500	.10	1.95	1.85	.36769	-.651	2.170	
ANOVA Table									
					Sum of Squares	df	Mean Square	F	Sig.

Withheld own ideas and conclusions effectively * Qualification Level of the Teacher	Between Groups	(Combined)	.218	1	.218	1.648	.210
	Within Groups		3.703	28	.132		
	Total		3.921	29			

Measures of Association		
	Eta	Eta Squared
Withheld own ideas and conclusions effectively * Qualification Level of the Teacher	.236	.056

Withheld own ideas and conclusions effectively * Teacher's Area of Expertise

Report								
Withheld own ideas and conclusions effectively								
Teacher's Area of Expertise	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
Physics	1.0500	1.0500	1.05	1.05	.00	.	.	.
Bio-Technology	1.1500	1.1500	1.05	1.25	.20	.14142	.	.
Life-Sciences	1.2500	1.2500	.80	1.65	.85	.26726	-.262	.108
Mathematics	1.3500	1.3000	1.15	1.60	.45	.22913	.935	.
Physical Sciences	1.2318	1.2750	.10	1.95	1.85	.51681	-.805	2.123
Chemistry	1.1375	1.1250	.85	1.45	.60	.28395	.130	-4.115
Applied Sciences	1.5000	1.5000	1.50	1.50	.00	.	.	.
Information Technology	.5500	.5500	.55	.55	.00	.	.	.
Total	1.2106	1.2500	.10	1.95	1.85	.36769	-.651	2.170

ANOVA Table								
				Sum of Squares	df	Mean Square	F	Sig.
Withheld own ideas and conclusions effectively * Teacher's Area of Expertise	Between Groups	(Combined)		.650	7	.093	.624	.730
	Within Groups			3.271	22	.149		
	Total			3.921	29			

Measures of Association		
	Eta	Eta Squared
Withheld own ideas and conclusions effectively * Teacher's Area of Expertise	.407	.166

Withheld own ideas and conclusions effectively * Class Taught by the Teacher

Report								
Withheld own ideas and conclusions effectively								
Class Taught by the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
6th Class	1.3629	1.3182	.85	1.90	1.05	.27139	.088	.511
7th Class	1.0750	1.0500	.80	1.35	.55	.17525	.372	.212
8th Class	1.2375	1.2500	.55	1.95	1.40	.40245	.091	1.540
9th Class	.1000	.1000	.10	.10	.00	.	.	.
Total	1.2106	1.2500	.10	1.95	1.85	.36769	-.651	2.170

ANOVA Table								
				Sum of Squares	df	Mean Square	F	Sig.
Withheld own ideas and conclusions effectively * Class Taught by the Teacher	Between Groups	(Combined)		1.688	3	.563	6.553	.002
	Within Groups			2.233	26	.086		
	Total			3.921	29			

Measures of Association		
	Eta	Eta Squared
Withheld own ideas and conclusions effectively * Class Taught by the Teacher	.656	.431

Analysis and Interpretation:

1) The Mean is 1.2106 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.25 which means fifty percent of the cases lie above and below it. The Range for Total teachers taken together is 1.85 for which minimum value is 0.1 and maximum value is 1.95. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.36769. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.84 and 1.57. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is -0.651. which means that the data is moderately negatively skewed. i.e., the number of low scorers is greater than the high scorers on the question of Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 2.17 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(a) The Mean is 1.2487 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.25 which means fifty percent of the cases lie above and below it. The Range for Graduate teachers taken together is 1.85 for which minimum value is 0.1 and maximum value is 1.95. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and

Conclusions Effectively. Standard deviation is 0.36541. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.88 and 1.61. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is -0.862. which means that the data is moderately negatively skewed. i.e., the number of low scorers is greater than the high scorers on the question of Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 3.404 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(b) The Mean is 1.02 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.05 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 0.55 and maximum value is 1.5. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.35285. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.66 and 1.37. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.039. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 0.307 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(c) We test the null-hypothesis for the relation Withheld Own Ideas and Conclusions Effectively * Qualification Level of the Teacher the value of the F-ratio comes out to be 1.648 and the p-value comes out to be 0.21 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 Withheld Own Ideas and Conclusions Effectively * Qualification Level of the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.058 as shown in the table. As we retain the null-hypothesis the strength of association between Withheld Own Ideas and Conclusions Effectively * Qualification Level of the Teacher is considered insignificant.

3(a) The Mean is 1.05 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.05 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 1.05 and maximum value is 1.05. This shows no difference between minimum and maximum values. This difference can be interpreted as no divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. 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 1.15 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.15 which means fifty percent of the cases lie above and below it. The Range for Bio-Technology teachers taken together is 0.2 for which minimum value is 1.05 and maximum value is 1.25. This shows low difference between minimum and maximum values. This difference can be interpreted as low divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.14142. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.00 and 1.29. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively 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 1.25 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.25 which means fifty percent of the cases lie above and below it. The Range for Life-Sciences teachers taken together is 0.85 for which minimum value is 0.8 and maximum value is 1.65. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.26726. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.98 and 1.51. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is -0.262. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 0.108 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(d) The Mean is 1.35 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.3 which means fifty percent of the cases lie above and below it. The Range for Mathematics teachers taken together is 0.45 for which minimum value is 1.15 and maximum value is 1.6. This shows low difference between minimum and maximum values. This difference can be interpreted as low divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.22913. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.12 and 1.57. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.935. 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 Withheld Own Ideas and Conclusions Effectively. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(e) The Mean is 1.2318 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.275 which means fifty percent of the cases lie above and below it. The Range for Physical Sciences teachers taken together is 1.85 for which minimum value is 0.1 and

maximum value is 1.95. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.51681. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.71 and 1.74. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is -0.805. which means that the data is moderately negatively skewed. i.e., the number of low scorers is greater than the high scorers on the question of Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 2.123 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(f) The Mean is 1.1375 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.125 which means fifty percent of the cases lie above and below it. The Range for Chemistry teachers taken together is 0.6 for which minimum value is 0.85 and maximum value is 1.45. This shows low difference between minimum and maximum values. This difference can be interpreted as low divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.28395. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.85 and 1.42. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.13. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is -4.115 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 1.5 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.5 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 1.5 and maximum value is 1.5. This shows no difference between minimum and maximum values. This difference can be interpreted as no divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. 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 0.55 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 0.55 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 0.55 and maximum value is 0.55. This shows no difference between minimum and maximum values. This difference can be interpreted as no divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. 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 Withheld Own Ideas and Conclusions Effectively * Teacher's Area of Expertise the value of the F-ratio comes out to be 0.624 and the p-value comes out to be 0.73 through ANOVA. The interpretation of the p-value reveals that it is much 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 Withheld Own Ideas and Conclusions Effectively * Teacher's Area of Expertise as a conclusion of this interpretation. The value of eta-squared is 0.166 as shown in the table. As we retain the null-hypothesis the strength of association between Withheld Own Ideas and Conclusions Effectively * Teacher's Area of Expertise is considered insignificant.

4(a) The Mean is 1.3629 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.3182 which means fifty percent of the cases lie above and below it. The Range for 6th Class teachers taken together is 1.05 for which minimum value is 0.85 and maximum value is 1.9. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.27139. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.09 and 1.63. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.088. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 0.511 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(b) The Mean is 1.075 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.05 which means fifty percent of the cases lie above and below it. The Range for 7th Class teachers taken together is 0.55 for which minimum value is 0.8 and maximum value is 1.35. This shows low difference between minimum and maximum values. This difference can be interpreted as low divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.17525. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.89 and 1.24. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.372. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 0.212 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(c) The Mean is 1.2375 which means on an average most teachers agree on Withheld Own Ideas and Conclusions Effectively. The Median is 1.25 which means fifty percent of the cases lie above and below it.

The Range for 8th Class teachers taken together is 1.4 for which minimum value is 0.55 and maximum value is 1.95. This shows high difference between minimum and maximum values. This difference can be interpreted as high divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. Standard deviation is 0.40245. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.83 and 1.63. This means, on an average most of the teachers agree on Withheld Own Ideas and Conclusions Effectively and some strongly agree with it. Skewness is 0.091. 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 Withheld Own Ideas and Conclusions Effectively. This is evident in the graphical representation of the data as well. Kurtosis is 1.54 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(d) The Mean is 0.1 which means on an average most teachers disagree on Withheld Own Ideas and Conclusions Effectively. The Median is 0.1 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 0.1 and maximum value is 0.1. This shows no difference between minimum and maximum values. This difference can be interpreted as no divergence in the mean scores on the response towards Withheld Own Ideas and Conclusions Effectively. 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 Withheld Own Ideas and Conclusions Effectively * Class Taught by the Teacher the value of the F-ratio comes out to be 6.553 and the p-value comes out to be 0.002 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 much 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 Withheld Own Ideas and Conclusions Effectively * Class Taught by the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.431 as shown in the table. As we reject the null-hypothesis the strength of association between Withheld Own Ideas and Conclusions Effectively * Class Taught by the Teacher indicates a large effect.

Conclusion:

The study focuses on preservice teacher's natural dispositions towards "Withheld Own Ideas and Conclusions Effectively" 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 "Withheld Own Ideas and Conclusions Effectively" in terms of Qualification Level of the Teacher and Teacher's Area of Expertise. Whereas a difference in pre-service teachers' response to "Withheld Own Ideas and Conclusions Effectively" in terms of Class Taught by the Teacher has been located also the study finds that the strength of association between Withheld Own Ideas

and Conclusions Effectively and Class Taught by the Teacher is large. Further, the study hints that the teachers teaching at the lower level are withholding own ideas and conclusions effectively of science learners more than their counterparts at higher levels of schooling in the selected schools.

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