International Research Journal of Human Resource and Social Sciences
ISSN(O): (2349-4085) ISSN(P): (2394-4218)
Impact Factor 6.924 Volume 10, Issue 03, March 2023
Website- www.aarf.asia, **Email** : editoraarf@gmail.com

LEARNERS' SPACES OR EXPECTED ANSWERS: EXPLORING TEACHERS DILEMMA

[1]Rakesh Kumar

[1]Assistant Professor, Dept. of Education, University of Delhi

[2]Karishma Sharma

[2]Ph.D. Scholar, Dept. of Education, University of Delhi

[3]Himani Sharma

[3]Freelance Writer and Researcher

Abstract

Since babies are born and adults start looking for responses from them, adults get into the traps of expectations from them. The contrary might also be true. Who knows? Who can know? This trap of looking for one's self into the responses of others seems to be an important form of meaning making process for 'human' beings(and we have no access to understand this about'other' beings). As babies grow, this trap of expected responses grows on both sides. A philosophical position on Preconceived Notions about the expected answers may be constructed as looking for oneself in others (but present work does not attempt this). Mutuality of existence and coexistence may be the premises on which this reflection may be based. Alternatively, it can be interpreted as Ego, sometimes self-centeredness and sometimes as simple reaffirmation about one's self too. When interpreted in terms of mutuality, a link or connection seems to establish when there is an agreement in the responses in terms of expectations. This process grows to the extent that pre-conceived notions about expected answers grows in general and in classroom contexts in particular. These preconceived notions about expected answers swells to the size that they start interfering in the regular co-construction of knowledge and ideas. In the process, a sense of supremacy may also creep in. Supremacy of not ideas, but individuality deeply sank in self-centeredness. In the context of classroom interactions, evolutions of learners' ideas are dependent to a large extent on the teachers' abilities to give adequate space to them to express and present their own ideas, however naïve these ideas may seem. ***Teachers are required to create those spaces in the teaching-learning process by extending these to the learners, those spaces that are often considered as essentially theirs.*** *In this context, teachers' abilities to come out of their pre-conceived notion of expected answer is to be studied along with the factors that might or might not affect this.The study focuses on preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer"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 "Could Come Out of the Pre-conceived Notion of Expected Answer"in term of Qualification Level of the Teacher. Whereas a difference in pre-service teachers' response to "Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of Teacher's Area of Expertise and Class Taught by the Teacher has been located. Also, the study finds that the strength of association between Could Come Out of the Pre-conceived Notion of Expected Answerfor Teacher's Area of Expertise and Class Taught by the Teacher is large. Further, the study hints that the teacher's area of expertise for teaching different subjects to science learners could help them to come out of the pre-conceived notion of expected answers. Also,the teachers teaching at the lower level could help the science learners to come out of the pre-conceived notion of expected answers more than their counterparts at higher levels of schooling in the selected schools. These factors had been located as research gaps in the study done by one of the researchers from this research team. The study contributes towards understanding the role of these factors in 'formal' science classroom settings while trying out 'informal environments' in eighteen selected schools under guidance of one of the researchers from this team.

Key Words: Culture of Science, learning strands, Science classrooms, Pre-service Teacher Education,Qualification Level of the Teacher, Teacher's Area of Expertise, Class Taught by the Teacher, Expected Answers

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) "That four-strandframework aligns tightly with the Strands 2 through 5. They have added two additional strands—Strands 1 and 6—which are of special value in informal learning environments. 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)".

Needand Background of the Study

Since babies are born and adults start looking for responses from them, adults get into the traps of expectations from them. The contrary might also be true. Who knows? Who can know? This trap of looking for oneself into the responses of others seems to be an important form of meaning making process. As babies grow, this trap of expected responses grows on both sides. Preconceived notions about the expected answers may be observed as looking for oneself in others too. Mutuality of existence, coexistence may be the premise on which this reflection is based. Sometimes this is interpreted as Ego, sometimes self-centeredness and sometimes as simple reaffirmation about oneself. When interpreted in terms of mutuality, a link or connection seems to establish when there is agreement in the responses in terms of expectations. This process grows to the extent that pre-conceived notions about expected answers grows in general and in classroom contexts in particular. These preconceived notions about expected answers swells to the size that they start interfering in the regular co-construction of knowledge and ideas. A sense of supremacy may also creep in. Supremacy of not ideas but individuals. Evolutions of learners' ideas is dependent to a large extent on the teachers' abilities to give adequate space to them to express and present their own ideas, however naïve these ideas may seem. Teachers are required to create those spaces in the teaching-learning process by extending to the learners, those spaces that are often considered as essentially theirs. In this context, teachers' abilities to come out of their pre-conceived notion of expected answer is to be studied along with the factors that might or might not affect this. There had been an innovative work of applying 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. In the process 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).Factors affecting "Could Come Out of the Pre-conceived Notion of Expected Answer" could not find space in these or other studies by the research team. The current study attempts to fill take that up.

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"Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of the identifiedfactors?

2. How do we interpret 'statistical descriptives' related to preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of the identifiedfactors?

3. What are the differences (if any) in preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer"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 "Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of the identified factors.

2. To interpret the 'statistical descriptives' related to preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of the identified factors.

3. To locate the differences (if any) in preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer"in terms of the identified factors.

Methodology, Sample and Tools:

An amalgamation of review of literature and experiences in the domain of science education brought about certain questions that needed to be explored. With this need evolved a tool in the form of questionnaire containing 26 items.This combination of close-ended and open-ended questions were related to specific context of teaching-learning processes. The specificity of these processes lies in the framework developed as an alternative to the much-celebrated Herbartian way of planning. This general tool was validated by the field experts in anall-inclusive way. Colleagues in the teacher education institutions were also engaged in the validation process. Issues such as ambiguity of language and style of formatting were identified and addressed before application of the tool. The researchers used IBM-SPSS for the purpose of analysis. Observation and unstructured interviews triangulated the data.

Thirty-eight Pre-Service Science teachers were chosen as purposive sample. Data could not be received from eight of them. So total thirty pre-service teachers constituted as sample of the study. 592 responses on lessons were received from them.To elaborate further, the sample was from two universities viz. University of Delhi and GGSIP University, Delhi. They were associatedwith 18 schools across Delhi for their internship program called School Life Experience Program. During this program, they were directed by one of researchers from this team. They applied alternative framework of Lesson and Unit planning through this guidance and direction. Different graduation and post-graduation subjects ensured that the diversity in expertise is maintained. Forpreserving the identity of the participating teachers, they were allotted codes from 1.01 to 1.30 and 2.01 to 2.08. These codes represented different colleges too. While the pre-service teachers were primary sample, their learners in the eighteen schools became the associated sample. The combined sample of teachers and the learners revealed itself to be heterogeneous. As a result, we can acceptthat heterogeneity in teaching-learning settings was applied and maintained for application of the framework developed as an alternative to the Herbartian system.

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%

Analysis of Data

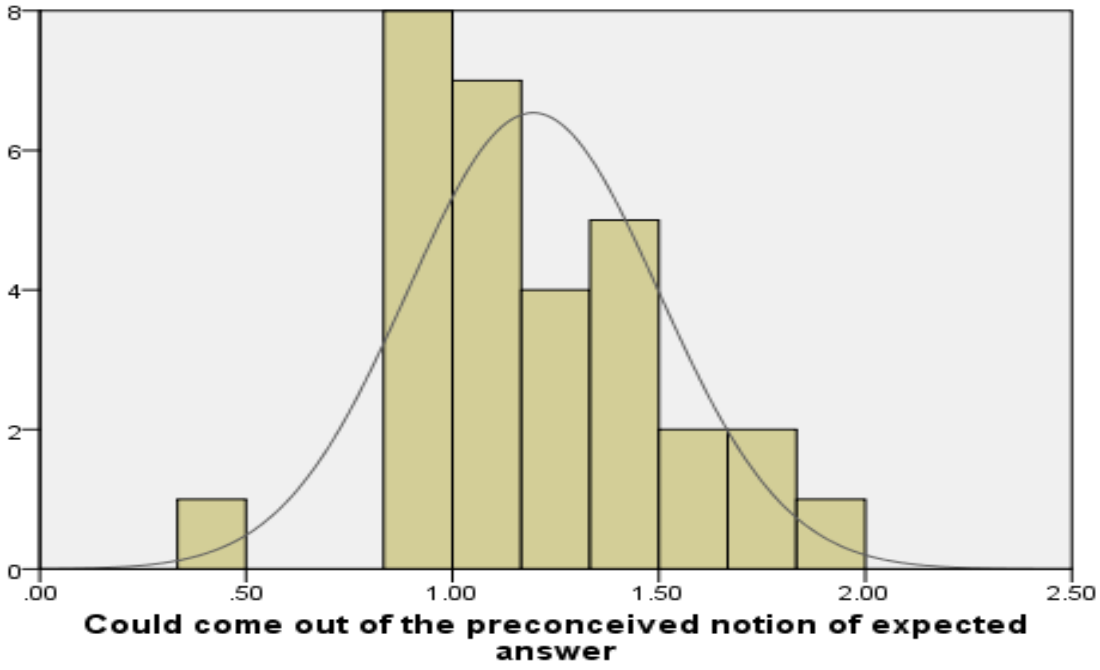
While there had been a very comprehensive tool that was developed, the issue "Encouraged Learners Attempt to Generate Solutions to Problems" was identified for analysis in this paper. On this subject, the responses as disagree, agree, and strongly agree were logged. These responses were quantified. For quantification marks zero, one and two were given to these responses. Thus, average scores of all pre-service teachers were calculated. The average scores of the thirty responding teachers are analysed and reported. As per the constraints of research questions and research objectives of the paperanalysis are being presented.

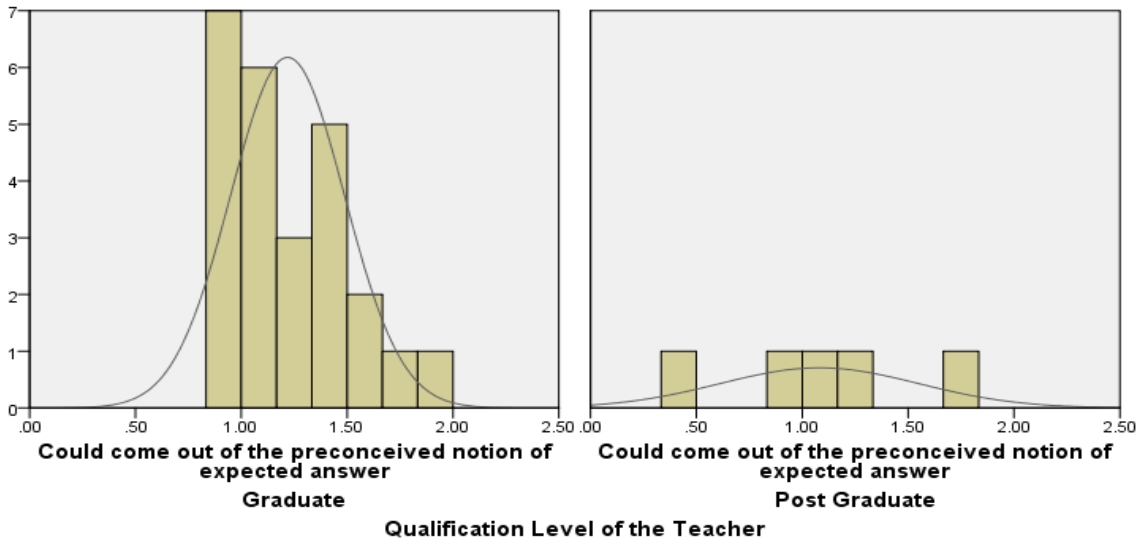
Findings

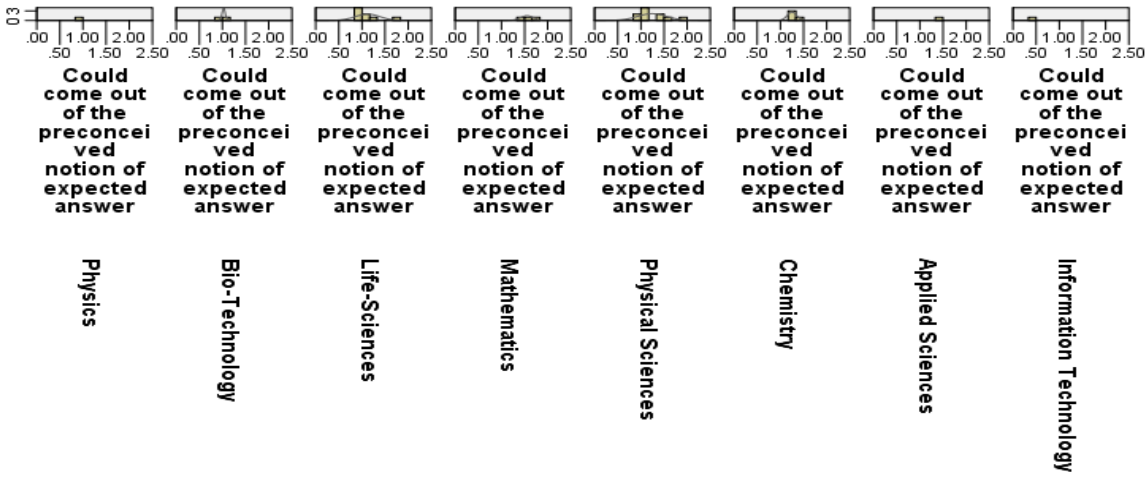
Table 1 shows the average scores of several teachers on the feedback schedule related to the Component "Could Come Out of the Pre-conceived Notion of Expected Answer" of the teaching-learning environment in damage of Teachers' Self-Assessment. The evaluation, interpretation and appropriate graphical descriptions had been used in the following discussions using the information from the Table 1.

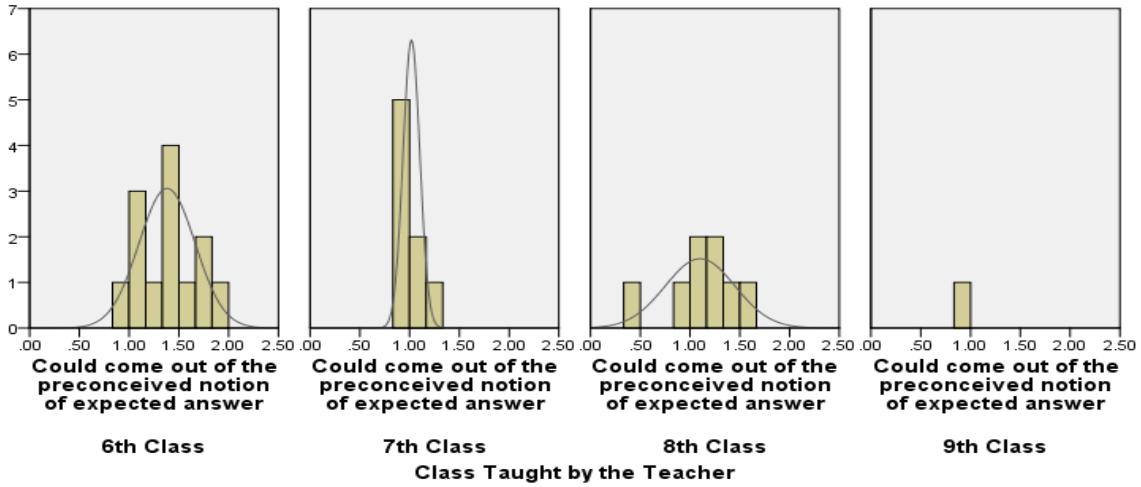
Table 1 - Individual average score of different respondents on the item: Could Come Out of the Pre-conceived Notion of Expected Answer

Tch. Cd.	Av. Score
103	0.95
109	1.5
114	1
122	1.45
127	1.05
128	1.45
2.01	1.2
101	0.95
102	1
104	1.4
105	0.95
106	1.7
107	0.95
108	1.05
11	1.05
111	1.2
112	1.4
113	1.45
117	1.05
118	1.9
119	1.15
12	1.1
121	1.15
123	1.7
124	1.5
125	1.2
126	1.2
13	0.85
2.02	0.4
2.03	0.95


8
6
4
2
0
.00
.50
1.00
1.50
2.00
2.50
Could come out of the preconceived notion of expected answer


7
6
5
4
3
2
1
0
.00
.50
1.00
1.50
2.00
2.50
Could come out of the preconceived notion of expected answer
Graduate
Could come out of the preconceived notion of expected answer
Post Graduate
Qualification Level of the Teacher





Case Processing Summary						
	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Could come out of the preconceived notion of expected answer * Qualification Level of the Teacher	30	100.0%	0	0.0%	30	100.0%

Could come out of the preconceived notion of expected answer * Teacher's Area of Expertise	30	100.0%	0	0.0%	30	100.0%
Could come out of the preconceived notion of expected answer * Class Taught by the Teacher	30	100.0%	0	0.0%	30	100.0%

Could come out of the preconceived notion of expected answer * Qualification Level of the Teacher

Report								
Could come out of the preconceived notion of expected answer								
Qualification Level of the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
Graduate	1.2182	1.1500	.85	1.90	1.05	.26899	.826	.068
Post Graduate	1.0800	1.1500	.40	1.70	1.30	.46984	-.306	1.288
Total	1.1952	1.1500	.40	1.90	1.50	.30508	.112	.812

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Could come out of the preconceived notion of expected answer * Qualification Level of the Teacher	Between Groups	(Combined)	.080	1	.080	.850	.364
	Within Groups		2.620	28	.094		
	Total		2.699	29			

Measures of Association		
	Eta	Eta Squared
Could come out of the preconceived notion of expected answer * Qualification Level of the Teacher	.172	.029

Could come out of the preconceived notion of expected answer * Teacher's Area of Expertise

Report								
Could come out of the preconceived notion of expected answer								
Teacher's Area of Expertise	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
Physics	.9500	.9500	.95	.95	.00	.	.	.
Bio-Technology	1.0250	1.0250	1.00	1.05	.05	.03536	.	.
Life-Sciences	1.1188	1.0750	.85	1.70	.85	.26449	1.712	3.593
Mathematics	1.5500	1.5000	1.45	1.70	.25	.13229	1.458	.
Physical Sciences	1.2405	1.0750	.95	1.90	.95	.31108	1.134	.674
Chemistry	1.2500	1.2000	1.20	1.40	.20	.10000	2.000	4.000
Applied Sciences	1.4500	1.4500	1.45	1.45	.00	.	.	.
Information Technology	.4000	.4000	.40	.40	.00	.	.	.
Total	1.1952	1.1500	.40	1.90	1.50	.30508	.112	.812

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Could come out of the preconceived notion of expected answer * Teacher's Area of Expertise	Between Groups	(Combined)	1.272	7	.182	2.802	.030
	Within Groups		1.427	22	.065		
	Total		2.699	29			

Measures of Association		
	Eta	Eta Squared
Could come out of the preconceived notion of expected answer * Teacher's Area of Expertise	.687	.471

Could come out of the preconceived notion of expected answer * Class Taught by the Teacher

Report								
Could come out of the preconceived notion of expected answer								
Class Taught by the Teacher	Mean	Median	Minimum	Maximum	Range	Std. Deviation	Skewness	Kurtosis
6th Class	1.3811	1.4000	.95	1.90	.95	.28260	.218	-.681
7th Class	1.0188	1.0000	.95	1.20	.25	.08425	1.601	2.915
8th Class	1.1000	1.1750	.40	1.50	1.10	.35051	-1.105	1.570
9th Class	.9500	.9500	.95	.95	.00	.	.	.
Total	1.1952	1.1500	.40	1.90	1.50	.30508	.112	.812

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Could come out of the preconceived notion of expected answer * Class Taught by the Teacher	Between Groups	(Combined)	.831	3	.277	3.856	.021
	Within Groups		1.868	26	.072		
	Total		2.699	29			

Measures of Association		
	Eta	Eta Squared
Could come out of the preconceived notion of expected answer * Class Taught by the Teacher	.555	.308

Analysis and Interpretation:

1) The Mean is 1.1952 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. 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 1.5 for which minimum value is 0.4 and maximum value is 1.9. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.30508. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.89 and 1.50. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 0.112. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 0.812 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 1.2182 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. 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 1.05 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 interpretated as high divergence in the mean scores on the response towards Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.26899. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.95 and 1.48. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 0.826. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 0.068 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 1.08 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. 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 1.3 for which minimum value is 0.4 and maximum value is 1.7. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.46984. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.61 and 1.54. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is -0.306. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 1.288 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 Could Come Out of the Pre-conceived Notion of Expected Answer * Qualification Level of the Teacher the value of the F-ratio comes out to be 0.850 and the p-value comes out to be 0.364 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 Could Come Out of the Pre-conceived Notion of Expected Answer * Qualification Level of the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.029 as shown in the table. As we retain the null-hypothesis the strength of association between Could Come Out of the Pre-conceived Notion of Expected Answer * Qualification Level of the Teacher is considered insignificant.

3(a) The Mean is 0.95 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 0.95 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 0.95 and maximum value is 0.95. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. 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 1.025 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.025 which means fifty percent of the cases lie above and below it. The Range for Bio-Technology teachers taken together is 0.05 for which minimum value is 1 and maximum value is 1.05. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.03536. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.67 and 1.37. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer 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 1.1188 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.075 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 0.85 and maximum value is 1.7. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.26449. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.85 and 1.38. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 1.712. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 3.593 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 1.55 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.5 which means fifty percent of the cases lie above and below it. The Range for Mathematics teachers taken together is 0.25 for which minimum value is 1.45 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.13229. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.41 and 1.68. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 1.458. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Kurtosis is incalculable. This is evident in the graphical representation of the data as well.

3(e) The Mean is 1.2405 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.075 which means fifty percent of the cases lie above and below it. The Range for Physical Sciences teachers taken together is 0.95 for which minimum value is 0.95 and maximum value is 1.9. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.31108. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.92 and 1.55. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 1.134. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 0.674 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 1.25 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.2 which means fifty percent of the cases lie above and below it. The Range for Chemistry teachers taken together is 0.2 for which minimum value is 1.2 and maximum value is 1.4. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.1. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.15 and 1.35. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 2. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 4 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 1.45 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.45 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 1.45 and maximum value is 1.45. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. 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 0.4 which means on an average most teachers disagree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 0.4 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 0.4 and maximum value is 0.4. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. 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 Could Come Out of the Pre-conceived Notion of Expected Answer * Teacher's Area of Expertise the value of the F-ratio comes out to be 2.802 and the p-value comes out to be 0.03 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 2.464 which means that we reject the null hypothesis. On the basis of this interpretation, we reject the null hypothesis for the relation Could Come Out of the Pre-conceived Notion of Expected Answer * Teacher's Area of Expertise as a conclusion of this interpretation. The value of eta-squared is 0.471 as shown in the table. As we reject the null-hypothesis the strength of association between Could Come Out of the Pre-conceived Notion of Expected Answer * Teacher's Area of Expertise indicates a large effect.

4(a) The Mean is 1.3811 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.4 which means fifty percent of the cases lie above and below it. The Range for 6th Class teachers taken together is 0.95 for which minimum value is 0.95 and maximum value is 1.9. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.2826. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 1.09 and 1.66. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 0.218. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is -0.681 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 1.0188 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1 which means fifty percent of the cases lie above and below it. The Range for 7th Class teachers taken together is 0.25 for which minimum value is 0.95 and maximum value is 1.2. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.08425. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.93 and 1.10. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is 1.601. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 2.915 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 1.1 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 1.175 which means fifty percent of the cases lie above and below it. The Range for 8th Class teachers taken together is 1.1 for which minimum value is 0.4 and maximum value is 1.5. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. Standard deviation is 0.35051. S.D. when interpreted with the calculated means, it implies that most of the teachers scored between 0.75 and 1.45. This means, on an average most of the teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer and some strongly agree with it. Skewness is -1.105. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. This is evident in the graphical representation of the data as well. Kurtosis is 1.57 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 0.95 which means on an average most teachers agree on Could Come Out of the Pre-conceived Notion of Expected Answer. The Median is 0.95 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 0.95 and maximum value is 0.95. 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 Could Come Out of the Pre-conceived Notion of Expected Answer. 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 Could Come Out of the Pre-conceived Notion of Expected Answer * Class Taught by the Teacher the value of the F-ratio comes out to be 3.856 and the p-value comes out to be 0.021 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 Could Come Out of the Pre-conceived Notion of Expected Answer * Class Taught by the Teacher as a conclusion of this interpretation. The value of eta-squared is 0.308 as shown in the table. As we reject the null-hypothesis the strength of association between Could Come Out of the Pre-conceived Notion of Expected Answer * Class Taught by the Teacher indicates a large effect.

Conclusion:

The system generally shows resistance to alternatives given to already working models. this however has its own strengths too. Why should we discard anything that is serving the purpose to a considerable extent? Herbartian models of lesson planning has been serving our purpose very

well till alternative theoretical frameworks started challenging its notions and design elements. In the alternative theoretical frameworks, more flexibilities were required. Absence of design elements specific to teaching-learning of science aggravated the issue. In this context an alternative model of designing teaching-learning was developed by one of the researchers of the team. This alternative model has been thoroughly researched by the team. As part of the study of different aspects different papers had been published so that the field can review the work and the alternative can be given more space. In the present study focus is on preservice teacher's natural dispositions towards "Could Come Out of the Pre-conceived Notion of Expected Answer" 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 "Could Come Out of the Pre-conceived Notion of Expected Answer" in term of Qualification Level of the Teacher. Whereas a difference in pre-service teachers' response to "Could Come Out of the Pre-conceived Notion of Expected Answer" in terms of Teacher's Area of Expertise and Class Taught by the Teacher has been located. Also, the study finds that the strength of association between "Could Come Out of the Pre-conceived Notion of Expected Answer" for Teacher's Area of Expertise and Class Taught by the Teacher is large. Further, the study hints that the teacher's area of expertise for teaching different subjects to science learners could help them to come out of the pre-conceived notion of expected answers. Also, the teachers teaching at the lower level could help the science learners to come out of the pre-conceived notion of expected answers more than their counterparts at higher levels of schooling in the selected schools.

References:

- Bell, P., Lewenstein, B., Shouse, A. W., & Feder, M. A. (2009). *Learning Science in Informal Environments: People, Places, and Pursuits*. THE NATIONAL ACADEMIES PRESS.

- Duschl, R. A., Schweingruber, H. A., & Shouse, A. W. (2007). Taking Science to School: Learning and Teaching Science in Grades K-8. In R. A. Duschl, H. A. Schweingruber, & A. W. Shouse (Eds.), *Taking Science to School*. THE NATIONAL ACADEMIES PRESS.

- Kumar, R. (2011). Development of Alternative Frameworks Among Learners in Science: A Reflection on the Learning Theories and Models. *Journal of Teacher Education in Developing Nations (2229-4694)*, *2*(2), 55–61.

- Kumar, R. (2012a). Nature of Science, Science Assessment and Constructivist Epistemology: An Attempt to Decode the Hidden Mysteries. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730)*, *1*(1).

- Kumar, R. (2012b). A Study of Intending Teachers' Organisation of the Content and Processes of the Science Lesson. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730)*, *1*(3).

- Kumar, R. (2012c). Encouraging Enquiry Approach in the Learners. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730)*, *1*(6).

- Kumar, R. (2013a). Addressing the Alternative Frameworks Amongst Learners: A Study of Classroom Context. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(6).

- Kumar, R. (2013b). An Analysis of Pre Service Teachers' Natural Disposition For Posing Interpretative Questions to the Learners in Science. *Indian Journal of Experimentation and Innovation in Education*, *2*(5).

- Kumar, R. (2013c). Carefully Designing the Science Activities Appropriate for the Group. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(1).

- Kumar, R. (2013d). Encouraging Collaborative Learning Environment in Science Classroom. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 3*(2).

- Kumar, R. (2013e). Attempting to take Learners Along in Conducting Classroom Activities. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(3).

- Kumar, R. (2013f). Identifying Design Features of Science Learning Environment: An Extrapolation of Learning Theories, Models and Ideas. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 3*(3).

- Kumar, R. (2013g). Constructing a Theoretical Framework on Alternative Frameworks Amongst Learners in Science. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 3*(4).

- Kumar, R. (2013h). Motivating Non-Participating Learners in Classroom. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(4), 1–8.

- Kumar, R. (2013i). Differentiating 'Scientific Concepts'' from "OTHER'' Concepts: An Analytico-Deductive Approach."' *Indian Journal of Education Research Experimentation and Innovation (ISSN-22310495), 3*(5). https://doi.org/10.1080/0950069900120507

- Kumar, R. (2013j). Gauging Teachers' Tolerance towards Individual Interpretations by the Learners. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(5).

- Kumar, R. (2013k). Preconceived Notion of Expected Answer and Teaching-Learning Contexts: An Analysis. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 3*(5).

- Kumar, R. (2013l). Probing the Interplay of Nature of Science with Culture of Science in the Formation of Alternative Frameworks. *Indian Journal of Experimentation And Innovation in Education (ISSN 2278-1730), 2*(5).

- Kumar, R. (2013m). An Analysis of Concept Specific Researches in the Formation of Alternative Frameworks. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(6).

- Kumar, R. (2013n). Analysis of Pre Service Teachers' Natural Disposition for Testing Pre-Concepts amongst Learners in Science: An Indian Context. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 2*(6).

- Kumar, R. (2014a). Culture of Science and Scaffolding: A Study of Teachers' Focus on Learners' Individual Explorations. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(1).

- Kumar, R. (2014b). Learners' adequacy in using Computer Assisted Learning in the Classroom. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(6).

- Kumar, R. (2014c). Studying Learners Alternative Frameworks on 'Magnets.' *International Journal of Innovative Education (ISSN 2393-8404), 1*(4).

- Kumar, R. (2014d). Scaffolding Learners to Generate Explanations, Arguments and Models: Taking Indication from Learning Strands Framework. *International Journal of Innovative Education (2393-8404), 1*(1).

- Kumar, R. (2014e). Teachers' Dispositions to Assist Learners in Metacognitive Processes. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278 -1730), 3*(1).

- Kumar, R. (2014f). Context of Forming Concepts and 'Other Concepts'': "Electric Current'' as a Theme of Weaving Linkages."' *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(2).

- Kumar, R. (2014g). Giving Space to Children's Voices, Experiences and Needs: An Analysis of Pre-service Teachers' Natural Dispositions. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(2).

- Kumar, R. (2014h). Practicing Culture of Science by Encouraging Learners' Attempt to Generate Solutions to Problems. *International Journal of Innovative Education (ISSN 2393-8404), 1*(2).

- Kumar, R. (2014i). Science Learning Contexts and Network of Conceptions in Reference to the Topic – AIR. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(2).

- Kumar, R. (2014j). What are Learners' Thinking While the Topic "Blood" is Undertaken in the Class? *International Journal of Innovative Education (ISSN 2393-8404), 1*(2).

- Kumar, R. (2014k). Analysing Learners' Reactions and Responses: Study of an Indian Science Classroom Context. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(3).

- Kumar, R. (2014l). Formation of Conceptions and 'Other Conceptions'' Related to "Food''."' *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(3).

- Kumar, R. (2014m). Need and Significance of Exploring Alternative Frameworks Amongst Learners in Science. *International Journal of Innovative Education (ISSN 2393-8404), 1*(3).

- Kumar, R. (2014n). Understanding Classroom Settings in Indian Context While Topic 'Cells'' is Taken-Up in Class.' *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(3).

- Kumar, R. (2014o). Understanding Teaching-Learning Context in Developing Students' Ideas on 'Light''.' *International Journal of Innovative Education (ISSN 2393-8404), 1*(3).

- Kumar, R. (2014p). Validating Language by Modifying the Language as Per Learners' Needs: An Analysis of Science Classroom Context. *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(3).

- Kumar, R. (2014q). Learners and Their Concepts of 'Force''.' *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(4).

- Kumar, R. (2014r). Studying the Science Learning Contexts While the Topic / Area of Explorations was 'UNIVERSE.' *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(4).

- Kumar, R. (2014s). 'Mirrors and Lenses'': Concept and Conceptual Change in Indian Science Classroom.' *Indian Journal of Education Research Experimentation and Innovation (ISSN-22310495), 4*(5).

- Kumar, R. (2014t). Strategies for Identifying Conceptions and 'Other Conceptions' Related to 'Plant Reproduction.' *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(5).

- Kumar, R. (2014u). Study of Learners' Alternative Frameworks Related to 'Rain''.' *International Journal of Innovative Education (ISSN 2393-8404), 1*(5).

- Kumar, R. (2014v). Conceptions, "Other Conceptions" and their sites: Specific case of studying "Sources of Energy." *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(6).

- Kumar, R. (2014w). Learners' Ideas on 'Soil'' and Classroom Implications.' *Indian Journal of Education Research Experimentation and Innovation (ISSN 2231-0495), 4*(6).

- Kumar, R. (2014x). Pre-service Teachers Notions about Alternative Frameworks/Misconceptions Amongst Learners in Science. *Indian Journal of Experimentation and Innovation in Education (ISSN 2278-1730), 3*(6).

- Kumar, R. (2015). Accommodating Teachers' Encounters and Learners' Speculations Related to Alternative Frameworks in Science. *International Journal of Innovative Education (ISSN 2393-8404), 2*(1).

- Prabha, S., Jha, A. K., & Kumar, R. (2012). Efficacy of Learning Strands in Science Education: Implications for Pre-service Teachers and Teaching in India. *Canada International Conference on Education-2012,* 157–162.

- Prabha, S., & Kumar, R. (2014). Prospective Science Teachers' Reflections on the Use of Learning Strands in Developing Lesson Design. *European Scientific Journal September 2014 /SPECIAL/*, *1*, 121–131.

- Prabha, S., Kumar, R., & Jha, A. K. (2013). Learning Strands: Empowering Prospective Teachers for Science Practices in Indian Context. *International Journal for Cross-Disciplinary Subjects in Education (IJCDSE)*, *4*(3), 1205–1212.