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EFFECT OF EPISODIC CONCEPTUALIZATION STRATERGY ON ACHIEVEMENTIN PHYSICS IN RELATION TO INTELLIGENCE

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Abstract

Science results from a process of conceptualization of a subject matter. The task of the science teacher is to help student to understand some of the content knowledge of science. The aim of this study is to find out the impact of episodic conceptualization strategy for the enhancement of achievement of secondary school students. The sample consists of 80 secondary school students of IX standard. The pre-test and post test equivalent group design was followed for this study. The data was analyzed using t test. In this episodic conceptualization based Instructional Strategy could significantly enhances the achievement of IX standard students. Traditional method of teaching could not attribute anything in enhancing the achievement of IX standard students. Intelligence does not influence the achievement of IX standard students. There is no interaction between the treatment and intelligence in influencing the achievement of IX standard students.

Keywords: *Episodic conceptualization strategy, achievement, intelligence, etc.*

INTRODUCTION

Science is the system of knowing the universe though data collected by observation and controlled experimentation. Science looks for different kinds of path and relationship such as relationship between different things relationship between the parts of things relationship between the properties possessed by several things etc. After discovering relationships, the science formulates statement that describes them. Man is able to conquer time and distance with the help of science. Science helped to travel in a space beyond the sky. Science improved his life conditions remarkably. Science gave eyes to blind, hearing for deaf, legs to lame. Science improved the quality and quantity of plants and animals. Thus

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science and scientific invention changed man's whole life by making it costly, comfortable and luxurious. It is changing entire existence of man in important aspects such as health, power, communication and transportation. It helps us to develop scientific attitude in the mind of the learner.

Science results from a process of conceptualization of a subject matter. The task of the science teacher is to help student to understand some of the content knowledge of science. Science learning requires presentation of learning material leading to formation of concepts. So concepts are to be presented by using a definite strategy like episodic conceptualization for increasing the content knowledge of the students.

Shulman defined pedagogical content knowledge as teacher interpretations and transformations of subject matter knowledge in the context of facilitating student learning proposal several key terms of PCK. (1) Knowledge of representation of subject matter, (2) understanding student conceptions of the subject and the learning and teaching implications that were associated with the specific subject matter, (3) general pedagogical knowledge (4) curriculum knowledge, (5) knowledge educational context, (6) Knowledge of purpose of education. To this conception of PCK, others have contributed valuable insights on the importance and relevance of linguistic & cultural characteristic of a diverse student population.

NEED OF THE STUDY

The call for transforming schools from teaching basic skills towards schools for thought (Bruer, 1993) seems to a growing consensus among educators. Researchers and educators worldwide have responded to that call, investing costly resources in projects whose primary goal is to enhance students thinking. However, a serious impediment to wide and successful implementation of many such projects is the lack of adequate methods; episodic conceptualization strategy is a new direction on this area.

If science is poorly taught by teacher or badly learnt by pupil, then it is just like the burdening mind with dead information. It generates new superstitions. Science is a subject where a teacher must select an appropriate strategy for teaching by internalizing the knowledge acquired in different concepts because this is the only subject where the students feel as a remedy to their problems, a leisure that they want to keep forever and many other things. So the teacher must equip himself with a skill of analyzing the concept and with an instructional strategy as well. Concept helps to understand the language of science. Thus concepts have wide applicability in science teaching.

"Pedagogical content knowledge is an accumulation of common element ie, knowledge of subject matter, knowledge of curricula, knowledge of Pedagogy. In PCK is knowing what, when and how to teach using a reservoir of knowledge of good teaching practice and experience". From research, it has become clear that multiple strategies are necessary to promote teacher learning. Several review studies revealed that for strategies aimed at the development of teacher knowledge, such as PCK, to be successful, the following elements are important:

(a) An explicit focus on teachers' knowledge, beliefs and concerns; (b) opportunities for teachers to experiment in their own practice; (c) collegial co-operation or exchange among teachers; and, (d) sufficient time for changes to occur.

The present study suggests one way for analyzing the concepts in physics. The teacher can equip himself with the skill of finding main characteristics, arranging them in a meaningful order. The modules prepared by researcher will help the teacher to establish rapport with the students. The present study will give innovative ideas and thoughts to curriculum setter's and text book writers.

OBJECTIVES

1. To prepare Episodic conceptualization strategy for teaching physics at secondary level
2. To find out the effectiveness of episodic conceptualization strategy in teaching physics st secondary level.
3. To compare the effectiveness of episodic conceptualization strategy in teaching physics with traditional method of teaching physics.
4. To study the effect of Instructional Strategy, Intelligence and their interaction on Pedagogical Content Knowledge by taking Pre-Achievement as covariate.

HYPOTHESIS

1. There is no significant difference between the experimental group and control group in the achievement of physics at pretest level
2. There is no significant difference between the experimental group and control group in the achievement of physics at posttest level.
3. There is no significant difference between the pretest and post test in the achievement in physics for the experimental group.
4. There is no significant difference between the pretest and post test in the achievement in physics for the control group.
5. There is a significant effect of Instructional Strategy, Intelligence and their interaction on Pedagogical Content Knowledge by taking Pre-Achievement as covariate

SAMPLE

The sample of the study consists of 100 students studying under CBSE syllabus at Malappuram. The sample consists of both boys and girls.

TOOLS USED

The tools used for the study are

- Episodic conceptualization strategy
- An achievement test

ANALYSIS AND INTERPRETATION

Hypothesis 1

There is no significant difference between the experimental group and control group in the achievement of physics at pretest level

't' test is applied to test the significance of difference between the mean achievement test scores of the experimental group and control group at pretest level

Table 1

Mean Achievement score on the experimental group compared with that of the control group at pretest level

Groups	N	Mean	S.D	't' value	Level of significance at 0.05 level
Experimental	50	20.23	2.17	0.49	Not significant
Control	50	19.90	1.97		

Table 1 indicate that the't' value is not significant at 0.05 level. The students of the experimental group do not differ significantly from the students of the control group in the mean achievement test scores at pre test level.

Hypothesis 2

There is no significant difference between the experimental group and control group in the achievement of physics at posttest level.

Table 2

Mean Achievement score on the experimental group compared with that of the control group at post test level

Groups	N	Mean	S.D	't' value	Level of significance at 0.01 level
Experimental	50	37.50	3.69	15.06	significant
Control	50	20.00	5.17		

Table 2 reveals that the't' value is significant at 0.01 level. Hence it could be inferred that there is a significant difference between the two groups as indicated by the mean value, it can be concluded that the students of the experimental group fared better in achievement test than the students of the control group. This again clearly shows that learning with the help of episodic conceptualization strategy will increase the achievement of the students better than learning through the conventional method.

Hypothesis 3

There is no significant difference between the pretest and post test in the achievement in physics for the experimental group.

Table 3

Mean Achievement test scores of pretest compared with that of the post test for the experimental group

Groups	N	Mean	S.D	't' value	Level of significance at 0.01 level
pretest	50	20.23	32.17	20.72	significant
Post test	50	37.50	3.69		

't' value is applied to test the significance of the difference between the mean achievement test scores of the pretest with that of the posttest for the experimental group.

Table 3 indicate that the't' value is significant at 0.01 level. Hence it could be inferred that there is a significant difference between the pretest and post test in the

achievement in physics for the experimental group. The higher mean value in the posttest shows that the students fared better in the posttest than in the pretest. This further shows that episodic conceptualization strategy has helped the students to score more in the post test.

Hypothesis 4

There is no significant difference between the pretest and post test in the achievement in physics for the control group.

Table 4

Mean Achievement test scores of pretest compared with that of the post test for the control group

Groups	N	Mean	S.D	't' value	Level of significance at 0.05 level
pretest	50	19.96	1.97	0.032	Not significant
Post test	50	20.26	5.17		

't' value is applied to test the significance of the difference between the mean achievement test scores of the pretest with that of the posttest for the control group

Table 4 indicates that the't' value is not significant at 0.05 level. Hence, it could be inferred that there is no significant difference between the pretest and post test in the achievement in physics for the control group.

Comparison of adjusted mean scores of pck of experimental group and control group by takng pre- pck as covariate

The objective was to compare adjusted mean scores of PCK of experimental group and control group by considering pre-PCK as covariate. The data were analyzed with the help of One Way ANCOVA by considering pre-PCK as covariate. The results are given in Table 4.4

Table 5

Summary of One Way ANCOVA of PCK by taking pre-PCK as covariate

Source of Variance	df	Sum of Squares (SSy.x)	Mean Square of Variance (MSSy.x)	Fy.x	Remark
Treatment	1	211.042	211.042	11..913	P<0.01
Error	47	832.593	17.715		
Total	49	1766.880			

** Significant at 0.01 level

Table 5 (a)

Summary of Adjusted Mean Scores of PCK by taking Pre PCK as Covariate

Group	Adjusted Mean Scores of PCK	Standard Error
Experimental Group	27.748	0.845
Control Group	23.612	0.845

Note: Pre Test=22.46

From Table 5, it can be seen that the adjusted F-Value (MSSy.x of Treatment/ error) is 11.913 (table value is 7.17) which is significant at 0.01 level with df= 1/47. It shows that the adjusted mean scores of achievement of experimental group and control group differ significantly. Thus the hypothesis that "there is a significant difference between adjusted mean scores of achievement of experimental group and control group by considering pre-achievement as covariate" is not rejected. Further from the table 5 (a) the adjusted mean scores of achievement of experimental group is 27.748 which is significantly higher than that of the control group whose adjusted mean score of achievement is 23.612 . It may, therefore, be said that the Episodic Conceptualization based instructional Strategy could significantly enhance the achievement of the students in comparison to traditional method when pre- achievement was considered as covariate.

Effect of treatment, intelligence and their interaction on pck by taking pre-achievement as covariate

The objective was to study the effect of treatment, intelligence and their interaction on achievement by taking pre- achievement as covariate. There were two levels of treatment, namely, Episodic Conceptualization Based Instructional Strategy and traditional method. The two levels of intelligence were above average intelligence and below average intelligence. Thus the data were analyzed with the help of 2X2 factorial design ANCOVA and the results are given in Table 6

Table 6

Summary of 2X2 Factorial Design ANCOVA of PCK by taking Pre PCK as covariate

Source of Variance	df	Sum of Squares (SSy.x)	Mean Square of Variance (MSSy.x)	Fy.x	Remark
Treatment	1	220.183	220.183	12.263	P<0.01
Intelligence	1	8.425	8.425	0.469	
Treatment X Intelligence	1	15.691	15.691	0.874	
Error	45	807.996	17.955		
Total	49	1766.880			

Table 6 (a)

Summary of Adjusted Mean Scores of PCK by taking Pre PCK as Covariate

Group	Adjusted Mean Scores of PCK	Standard Error
Experimental Group	27.77	0.866
Control Group	23.50	0.856
Above Average Intelligence Group	26.05	0.788
Below Average Intelligence Group	25.22	0.927

Note: Pre PCK is 22.46

Effect of Treatment on PCK by taking Pre- achievement as covariate

From the table 6(a), it can be seen that the adjusted F- value is 12.263 (table value is 7.23) which is significant at 0.01 level with df=1/45. It shows that the adjusted mean scores of achievement of Episodic conceptualization based instructional Strategy and traditional method differ significantly. So there was a significant effect of episodic conceptualization based instructional Strategy on achievement. Further the from the table 6 (a), adjusted mean score of achievement of experimental group is 27.77 which is significantly higher than that of control group whose adjusted mean score of achievement is 23.50 . It may, therefore, be said that the episodic conceptualization based instructional strategy could significantly enhance achievement of the students in comparison to traditional method when pre-achievement was considered as covariate.

Effect of Intelligence on PCK by taking Pre-achievement as covariate

From Table 6(a), it can also be seen that the adjusted F-Value for intelligence is 0.469 (table value is 4.06 at 0.05 level) which is not significant at 0.05 level with df=1/45. It means that the adjusted mean scores of achievement of students belonging to above average intelligence and below average intelligence groups do not differ significantly. So there was no significant effect of intelligence on achievement of students when pre-achievement was taken as covariate. Further from the table 6(a) the adjusted mean score of achievement of students belonging to above average intelligence group is 26.05 which is not significantly higher than that of below average intelligence group where adjusted mean score of achievement is 25.22. It may, therefore, be said that [illegible] the increase in intelligence, do not affect [illegible] achievement of Prospective teachers [illegible] pre-achievement was taken as covariate. Thus Episodic Conceptualization [illegible] Instructional Strategy can be applied [illegible] group of prospective teachers irrespective of their difference in intelligence.

Effect of interaction between Treatment and Intelligence on PCK [illegible] taking Pre- achievement as covariate

From the table 6(a), it can be seen [illegible] the adjusted F-Value for interaction between treatment and intelligence is 0.874 [illegible] not significant. It means that adjusted mean score of achievement of students belonging to above average and below average intelligence when taught through treatment and traditional Method did not differ significantly when groups were matched in respect of pre-achievement. So there was no significant effect of interaction between treatment and intelligence on achievement of students when pre-achievement was considered as covariate. Thus, the hypothesis that "there is a significant effect of interaction between treatment and intelligence on achievement by considering pre-achievement as covariate" is rejected. It may, therefore, be said that the achievement was found to be independent of interaction between treatment and intelligence when pre-achievement was taken as covariate

Main Effect and Interaction Effect

From the above analysis it seen that only one of the main effect is significant at 0.01 level. That is the F- ratio for the effect of treatment, which is the influence of the Episodic Conceptualization Based Instructional Strategy is 12.263 is significant at 0.01 levels and the other main effect intelligence which is not significant at [illegible]

level (F-ratio= 0.469). The interaction effect F-ratio=0.874, of treatment and intelligence is not significant. The increase in F-ratio of achievement from 11.913 to 12.263 is due to the interaction of intelligence. This indicates that in the above experiment the main effect like Episodic Conceptualization Based Instructional Strategy contribute positively for enhancing achievement. Whereas the other main effect intelligence and interaction between treatment and intelligence have no significant effect on achievement of prospective teachers. So the developed package can be applied to any group of prospective teachers without considering their difference in the level of intelligence for enhancing their Pedagogical Content Knowledge

CONCLUSION

- There is no significant difference between the experimental group and control group in the achievement of physics at pretest level
- There is significant difference between the experimental group and control group in the achievement of physics at posttest level. The students learning with the help of episodic conceptualization strategy fared better in science than the students learning through the conventional method.
- There is significant difference between the pretest and post test in the achievement in physics for the experimental group. This shows that episodic conceptualization strategy has helped the students to score more marks in the posttest.
- There is no significant difference between the pretest and post test in the achievement in physics for the control group. This shows that conventional teaching method of teaching will not help the students to score more marks in the post test.
- Intelligence does not influence the achievement of IX standard students.
- There is no interaction between the treatment and intelligence in influencing the achievement of IX standard students

EDUCATIONAL SIGNIFICANCE

- Episodic conceptualization strategy is effective in developing content knowledge and achievement among students.
- Topics are to be presented by using a episodic conceptualization strategy so that knowledge of students can be enhanced.
- Previous knowledge is given more importance while teaching topic in physics.

REFERENCES

Ausubel, D. P. (1968). Educational Psychology A Cognitive View. New York: Holt, Rinehart Wintson.

Best, J.W., &Khan, J.V. (2005). Research in education (9th ed.).New Delhi: Prentice –hall of India.

Bhattacharyya, & Dipak, Kumar. (2006). Research Methodology. New Delhi: Excel Books.

Charles, C.M. (1998).Introduction to Educational Research.NewYork: Longman.

Ebel, R.L. (1972). Essentials of Educational Measurement. Engel Wood Cliffs: N, J. Crencice Hall.

Garret, H .E. (2008). Statistics in Psychology and Education. New Delhi: Surjeet Publication.

Garret, H.E. (1961). Statistics in Psychology and Education. Bombay: Vakils, Feffer and Simons, Ltd.

Kothari, C.R. (2004).Research Methodology; Methods and Techniques.NewDelhi: Newage International Publications.