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Research Paper

Comparative Study on Geography Teachers' Pedagogical Content Knowledge (PCK) and Self-Efficacy in West Bengal, India.

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ABSTRACT: *The Present study was conducted to compare the pedagogical content knowledge and self-efficacy of geography teachers in relation to location, gender and to find out the relationship between the pedagogical content knowledge and self-efficacy. Descriptive survey method was adopted in this study. A self made tool was used to measure pedagogical content knowledge of geography teacher and a standardized tool was adapted to measure self-efficacy of geography teachers. The study found that, (i) There was no significant difference in pedagogical content knowledge and self-efficacy of rural and urban geography teachers. (ii) There was also no significant difference in pedagogical content knowledge and self-efficacy of male and female geography teachers. (iii) The pedagogical content knowledge and self-efficacy of geography teachers was positive and significantly relationship was found.*

Keywords*: Geography Teacher, Pedagogical content knowledge, Self-efficacy.*

I. INTRODUCTION

The studies on Pedagogy Content Knowledge (PCK) since it was proposed by Shulman in 1986 have provided coverage of different components [1]. Most of the PCK components refer to cognitive knowledge mandatory of the teachers in classroom teaching. Studies of the performance of the teachers find self-efficacy as a PCK component that is in the teachers' affective domain. Self-efficacy mediates between the teachers' knowledge of instructional strategies of geography teaching and students' understanding of geography knowledge [2]. The relationship between self-efficacy and cognitive knowledge of PCK shows the relationship is equally positive [3]. Teachers' self-efficacy will concern with the implementation of the PCK through the teaching in class. The relationship properties of PCK-self efficacy can be referenced in the construction of training for pre-service and in-service teachers in science teaching [4]. According to [5] teachers with high teaching efficacy beliefs have a tendency to apply a variety of methods in their teaching instruction. In addition, the higher the self-efficacy of teachers teaches, they are more confident in giving instruction. [6] Saw a positive relationship between knowledge of PCK pre-service teachers' self-efficacy beliefs about their ability to teach in the classroom. [7] Stated that the professional experience (execution of PCK) and individual features (efficacy) teachers have a significant outcome on the teaching and learning of science in the classroom. Self-efficacy beliefs and Pedagogy Content Knowledge (PCK) influence teaching qualification of pre-service and in-service teachers, so that the bilateral relations of self-efficacy and PCK needs to be studied in order to be a conduct in regulating the process of teachers training. According to [8] an increase of knowledge i.e, PCK, students' learning outcome with strategies teachers will lead to an enhance in self-efficacy beliefs, otherwise the probable for increased self-efficacy of teachers in the classroom will increase the probability that the science teaching is doing force based on pedagogical content knowledge.

Based on a literature review, this paper aims to describe the comparison of PCK with self-efficacy of geography teachers in respect of location and gender, west Bengal, India.

1.1. Objectives

(i) To compare the Pedagogical Content Knowledge (PCK) of geography teacher in relation to location and gender.
(ii) To compare the self-efficacy of geography teacher in relation to location and gender.
(iii) To find out the relationship between PCK and self-efficacy of geography teacher.

1.2. Hypotheses

H_O1: There is no significant difference between rural and urban geography teachers in respect of their mean score in PCK.
H_O2: There is no significant difference between male and female geography teachers in respect of their mean score in PCK.
H_O3: There is no significant difference between rural and urban geography teachers in respect of their mean score in self-efficacy.
$H_0$4: There is no significant difference between male and female geography teachers in respect of their mean score in self-efficacy.
H_O5: There is no significant relationship between PCK and self-efficacy of geography teachers.

II. METHODOLOGY

2.1. Design: keeping objectives of the study, descriptive survey method was used.
2.2. Sample: The researchers selected the six districts (i.e. Howrah, Purba Medinipur, Nadia, Hoogly, Murshidabad and Paschim Medinipur) from the southern part of West Bengal through random basis. After obtaining the list of schools from the official website of the West Bengal Board of Secondary Education, 327 schools were selected on random basis. Then researcher attained the 401 geography teachers from those schools.
2.3. Tools: Researcher had used self developed standardised PCK measuring tool to find out geography teachers' PCK in Bengali medium school for IX standard students in West Bengal, India. Second was Self-efficacy scale (SES) constructed and validated by Dr. Arun Kumar Singh and Dr. Shruti Narin, published by NPC Agra, India.
2.4. Analisys: Quantitative data analysis procedures were followed for this study. The data were analyzed through IBM SPSS 22.0 version and the significance of't' were tested at 0.05 level of significance. The collected data were analyzed by using mean, SD, 't'-test and Pearson correlation.

III. RESULTS

3.1. Objective; 1: It was observed (TABLE. 1) that, variation wise there were slight differences in the mean scores and standard deviation of scores of PCK with respect to the categorical variables. Therefore, it was decided to study the significance of difference between the two groups of each categorical variable. Hence, the independence sample't' test was adopted to find out the Levene's Test for Equality of Variance and 't' test for Equality of Means. The analysis (TABLE. 2) shows that, in case of Levene's Test for Equality of Variance the F value were .299 and 2.79 and corresponding p value were .585 ($p > .05$) and .096 ($p > .05$), for the variations in respect of location and gender respectively. Here, for PCK the variability in the two conditions was the same in location and gender thus equal variance can be assumed for both purposes.

Table 1; Group Statistics of PCK of Geography teachers; Location, Gender.

	Variations		N	Mean	Std. Deviation	Std. Error Mean
Pedagogical Content Knowledge	Location	Rural	285	25.06	4.42	.26
		Urban	116	24.91	4.67	.43
	Gender	Male	243	25.26	4.74	.31
		Female	158	24.64	4.05	.32

Table 2; Independent sample 't'- test of PCK of geography teachers in respect of location, Gender.

PCK	Levene's Test for Equality of Variance			't' test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Location Variation (Rural vs. Urban)	Equal variances assumed	.299	.585	.312#	399	.755
Gender (Male vs. Female)	Equal variances assumed	2.790	.096	1.353#	399	.177

(# Not Significant at .05 level)

"TABLE. 2" also shows that, in case of comparing the mean score of PCK between rural and urban geography teachers, the calculated $\mathbf{t}_{(399)}$ value was .312 and p = .755 (p > .05). Hence,' t ' was not significant at .05 level. So, $\mathbf{H_0 1}$ was not rejected and it can be said that, the rural teachers (M = 25.06) were not significantly different from the urban teachers (M = 24.91) with respect to the PCK in geography. In case of comparing the mean score of PCK between male and female geography teachers, the calculated $\mathbf{t}_{(399)}$ value was 1.353 and p = .177 (p > .05). Hence, 't' was not significant at .05 level. So, $\mathbf{H_0 2}$ was not rejected and it can be said that, the male teachers (M = 25.26) were not significantly different from the female teachers (M = 24.64) with respect to the PCK in geography.

Objectives

It was observed (TABLE. 3) that, variation wise there were too slight differences in the mean scores and standard deviation of the categorical variables. Therefore, it was decided to study the significance of difference between the two groups of each categorical variable. Hence, the independent sample't' test was adopted to find out the Levene's Test for Equality of Variance and 't' test for Equality of Means.

The analysis (TABLE. 4) shows that, in case of Levene's Test for Equality of Variance the calculated F were .000, .003, and corresponding p value were .999 (p > .05), .960 (p > .05), for the variations in respect of location, gender respectively. Here, for self-efficacy the variability in the two conditions are the same, thus equal variance can be assumed for all variations.

Table 3; Group Statistics of Self-Efficacy of teachers; Location, Gender.

	Variations		N	Mean	Std. Deviation	Std. Error Mean
Self-Efficacy	Location	Rural	285	76.76	6.92	.41
		Urban	116	76.67	6.74	.63
	Gender	Male	243	76.99	6.72	.43
		Female	158	76.34	7.06	.56

Table 4; Independent sample't' test of Self-Efficacy of geography teachers in respect of location, gender.

Self-Efficacy	Levene's Test for Equality of Variance			't' test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Location Variation (Rural vs Urban)	Equal variances assumed	.000	.999	.113#	399	.910
Gender Variation (Male vs Female)	Equal variances assumed	.003	.960	.921#	399	.357

(# Not Significant at .05 level)

"TABLE. 4" also shows that, in case of comparing the mean score of Self-Efficacy between rural and urban geography teachers, the calculated $\mathbf{t}_{(399)}$ value was .113 and p = .910 (p > .05). Hence, 't' was not significant at .05 level. So, $\mathbf{H_0 3}$ was not rejected. It can be said that, the rural teachers (M = 76.76) were not significantly different from the urban teachers (M = 76.67) with respect to Self-Efficacy. In case of comparing the mean score of Self-Efficacy between male and female geography teachers, the calculated $\mathbf{t}_{(399)}$ value was .921 and p was .357 (p > .05). Hence, 't' was not significant at .05 level. So, $\mathbf{H_0 4}$ was not rejected. It can be said that, the male teachers (M = 76.99) were not significantly different from the female teachers (M = 76.34) with respect to Self-Efficacy.

Objective 3: The analysis (TABLE. 5) shows that, correlation coefficient i.e. 'r' between PCK and self-efficacy was .158. This indicates that a positive correlation existed between those variables. The 'p' value was .001 (p < .05) which was significant at 0.05 level. Hence, $\mathbf{H_0 5}$ was rejected. Therefore it can be said that, there existed positive and significant relationship between score of PCK and score of Self-Efficacy of the geography teachers.

Table 5; Correlation Matrix of Pedagogical Content Knowledge and Self-Efficacy of Geography teachers.

		PCK	Self-Efficacy
Pedagogical Content Knowledge (PCK)	Pearson Correlation	1	.158*
	Sig.(2-tailed)		.001
	N	401	401
Self-Efficacy	Pearson Correlation	.158*	1

	Sig.(2-tailed)	**.001**	
	N	**401**	**401**

***Correlation is significant at the 0.05 level (2-tailed).**

IV. FINDINGS AND DISCUSSIONS

The rural geography teachers were not significantly different from the urban geography teachers in respect to the PCK. The male geography teachers were not significantly different from the female geography teachers in respect to the PCK. This result is supported by [9]. The rural geography teachers were not significantly different from the urban geography teachers in respect to Self-Efficacy. The male geography teachers were not significantly different from the female geography teachers in respect to Self-Efficacy. The similar no significant difference was recorded by [10]. There was positive and significant relationship between PCK and self-efficacy of geography teachers'. The present study is supported by earlier studies [3, 4, 11].

V. CONCLUSION

Geography teachers PCK and self-efficacy are not changeable in respect of their location and gender in West Bengal, India, who are continuing direct teaching for geography subject in Bengali medium school affiliated by WBBSE. On the other hand, PCK of geography teachers goes high or low corresponding to the self-efficacy. From the findings it was recommended that, different authorities are engaged to train both pre-service and in-service programme for making and developing of geography teachers have to improve teachers' self-efficacy and to support them to face professional requirements with high level of PCK.

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