Full text open access online (Since 2009)

PRINT: ISSN 0975-1122 ONLINE: ISSN 2456-6322

Int J Edu Sci, 47(1): 19-33 (2024)
DOI: 10.31901/24566322.2024/47.01.1389

Pedagogical Content Knowledge (PCK) of Social Science Teacher in Relation to Teachers Characteristics

Vandana* and Rupalin Syiem

Department of Education, North-Eastern Hill University, Shillong, Meghalaya, India 793022

KEYWORDS Knowledge. Pedagogy. School Teachers. Social Science. Teachers' Knowledge

ABSTRACT Impactful teaching is of paramount importance in the teaching-learning process. Pedagogical content knowledge of teachers plays a crucial role in determining the quality of teaching. The present study aimed to evaluate social science teachers' pedagogical content knowledge (PCK), focusing on variations in PCK based on personal and professional characteristics. The present study employed a descriptive survey method and used systematic random sampling. Data was collected from 200 school teachers of Meghalaya using a multiple-choice pedagogical content knowledge questionnaire. The results showed that most teachers had moderate PCK and there was no significant difference in PCK based on gender and school location. However, a significant difference was found based on teachers' qualifications and teaching experience. The current study also found that teachers' PCK positively relates to their teaching experience. The study's findings can be used to improve the effectiveness of teacher preparation programs for both pre-service and in-service teachers.

INTRODUCTION

For effective teaching, possessing knowledge of the subject matter alone is inadequate. This has led numerous researchers to investigate the essential knowledge and skills necessary for quality teaching (Rollnick and Mavhunga 2016). Several researchers also agreed that in addition to subject-matter knowledge, teachers must have the ability to communicate that knowledge to students in the most accessible form (Ball et al. 2008). Some scholars also pointed out that as teachers, they should possess knowledge of the subject matter, students' pedagogy, and curriculum knowledge (Ball and McDiarmid 1990; Kilic 2009) and integrate them effectively in the different phases of teaching to enhance students learning (Shulman 1986; Ball and McDiarmid 1989; Magnussen et al. 1999; Fukaya and Uesaka 2023). Jacob et al. (2020) emphasised that effective teaching should not only highlight the teacher's expertise but also their ability to provide students with a meaningful understanding of the content, which highlights the crucial role of pedagogical content knowledge (PCK) in classroom instruction.

Coined by Lee Shulman in the 1980s, pedagogical content knowledge (PCK) has gained significant attention in education, particularly in teacher knowledge and effective teaching practices for decades since its inception (Filgona et al. 2020). Shulman (1986) has identified pedagogical content knowledge as the amalgamation of content and pedagogy, which represents the blending of content and pedagogy into an understanding of how particular topics, problems, or issues are organised, represented, and adapted to the diverse needs, interests, and abilities of learners. Pedagogical content knowledge sets teachers apart from subject experts (Gudmundsdottir and Shulman 1987), emphasising that teachers must have a deep understanding of the content and the most effective ways of teaching to make it accessible to learners (Gess-Newsome et al. 2019).

Social science at the school level helps learners explore the aspects of human society and complex human relationships (Prasad 2008). Its contents are mainly drawn from four disciplines, that is, History, Geography, Political Science, and Economics (Choudhury 2022). Social science perspectives and knowledge are indispensable to building the knowledge base for a just and peaceful society (Prasad 2008). Recognising the crucial role of teachers in curriculum transac-

Address for correspondence:
Dr. Vandana,
Assistant Professor,
Department of Education,
North-Eastern Hill University, Shillong,
Meghalaya, India 793022
E-mail: vandana@nehu.ac.in

tion and comprehension by students, social sciences teachers are expected to prepare children to adapt to the highly skilled and global citizens of the 21st century (NCERT 2005). Likewise, pedagogical content knowledge is important for teachers as they have to effectively engage students from diverse backgrounds within the same classroom. Further, social science is often perceived as a non-utility subject, leading to low self-esteem among teachers and disinterest among students in grasping its concept (Prasad 2008). It is, therefore, vital for social science teachers to have a deep understanding and skills that integrate both their knowledge of the content and knowledge of learners (Etkina 2010) and help in fostering a positive learning environment that enhances student outcomes.

Research on pedagogical content knowledge of social science teachers revealed that effective teaching of social studies lies on teacher comprehensive understanding that combines several components of pedagogical content knowledge, such as content, pedagogy, learner characteristics, and knowledge of context in a unique way rather than just content or pedagogical knowledge separately (Shulman 1987). Studies also show that teachers' characteristics, such as their educational background, teaching experience, and reflective practices, significantly impact their pedagogical content knowledge (PCK). As cited in Roy and Roy (2015), it was found that teachers' educational qualifications and teaching experiences influence teachers' pedagogical content knowledge. Similarly, Monte-Sano and Budano (2013) studied the development of pedagogical content knowledge in two novice history teachers and findings showed that the teachers' pedagogical content knowledge varied based on context and experience. Additionally, Adams et al. (2023) identified that professional development positively impacted pedagogical content knowledge. Similarly, Anney and Hume (2014) highlighted that intervention through teachers' professional learning communities (PLCs) strengthened generic aspects of teachers' pedagogical content knowledge. Pedagogical content knowledge (PCK) plays a crucial role in influencing students' performance. For instance, it was observed that teachers with high pedagogical content knowledge positively impact student learning (Evens et al. 2015) and motivation (Maryani and Martaningsih 2015). Additionally, Mizzi (2024) revealed how teachers developed PCK to enhance student engagement and understanding in economics education. Another study (Dora and Mohalik 2017) examined the use of pedagogical content knowledge in classroom transactions by social science teachers. It revealed that teachers with low pedagogical content knowledge struggled to analyse students' mistakes and identify their learning needs. On the other hand, Mishra (2021) pointed out that teachers well equipped with pedagogical content knowledge were able to point out the reasons for students' fear regarding the subject and understand students' conceptions and misconceptions better. Furthermore, a study on teaching social sciences, particularly geography, at the secondary level in Meghalaya found that students encounter difficulties due to teachers' inadequate content knowledge, pedagogical skills, and communication abilities (Sarif et al. 2020). Consequently, the teaching of social science often becomes monotonous, failing to foster an engaging learning environment, which leads to students losing interest in the subject. Hence it could be stated that there is a strong link between pedagogical content knowledge and students' learning, interest, and motivation (Jones and Moreland 2004). However, Tuithof et al. (2019) noted that research on the pedagogical content knowledge (PCK) of social science teachers is limited, with significantly more studies conducted on science and mathematics teachers, highlighting the need for further research in this aspect.

The above discussions explored teachers' pedagogical content knowledge, and it was evident that existing reviews reflected teachers' qualifications, professional development, and years of teaching experience, which influence their pedagogical content knowledge. Additionally, the researcher found very few studies interrogating the role of teacher background and their pedagogical content knowledge. This knowledge gap led the researcher to comprehensively analyse the pedagogical content knowledge of secondary school social science teachers in relation to their characteristics, including gender, location, academic qualifications, professional qualifications, and teaching experience.

Objectives

The study objectives are formulated as follows. First, to study the levels of pedagogical content knowledge of social science teachers, second, to study the differences in teachers' pedagogical content knowledge on the basis of sex, locale, educational qualification, professional qualification, and teaching experience, and finally, to find the relationship between teachers' pedagogical content knowledge and teaching experience.

Hypothesis

The present study's hypotheses suggest no significant difference in teachers' pedagogical content knowledge when considering factors such as sex, school locale, academic qualifications, professional qualifications, and teaching experience. Furthermore, the study posits no significant relationship between teachers' pedagogical content knowledge and their teaching experience.

METHODOLOGY

Method

The present study employs a descriptive survey method to obtain elaborated details on the pedagogical content knowledge of social science teaching at the secondary school levels. It was conducted among social science teachers from secondary schools in the three districts of Meghalaya, namely, East Khasi Hills, West Khasi Hills, and Ri Bhoi Districts affiliated with the State Board (MBOSE).

Sample of the Study

A systematic random sampling method was used to select 200 teachers from the target population and a detailed profile of sampled teachers is given below.

Teachers' Profile

Table 1 outlines the characteristics of teachers. The Table indicates that out of 200 teacher respondents, 21 percent are males and 79 percent are females. Additionally, it was observed that 43.5 percent of them taught in urban schools and 56.5 percent of teachers taught in rural schools. Regarding academic qualification, it was observed that out of 200 teachers, 45.5 percent of teachers were post-graduates, and 54.5 percent were graduates. The Table also shows that 68 percent of the teachers were professionally qualified while 32 percent were not. With regards to teaching experience, it was categorised into three categories, that is, novice (3 years and below), less experienced (4-10 years), and experienced teachers (11 years and above). It was found that 10.5 percent are novice teachers, 39 percent are less experienced, and 50.5 percent are experienced teachers.

Instrument for Data Collection

In the present study, the researcher used a *Pedagogical Content Knowledge Questionnaire (PCKQ)* constructed and standardised by the researcher. The tool consisted of 40 MCQs designed to assess the pedagogical content of social science teachers. The dimensions of ped-

Table 1: Teachers' profile (N=200)

Characteristics	*Category*	*Frequency*	*Percentage*
Sex	Male	42	21
	Female	158	79
Locale	Urban	87	43.5
	Rural	113	56.5
Academic Qualification	Postgraduate	91	45.5
	Graduate	109	54.5
Professional Qualification	Professionally qualified	136	68
	Professionally unqualified	64	32
Teaching Experience (in years)	Novice (Below 3 years)	21	10.5
	Less experienced (4-10)	78	39
	Experienced (11 years and above)	101	50.5

Source: Authors (October 2024)

agogical content knowledge included in the tool consist of teachers' knowledge of curriculum, teachers' knowledge of learners' and learners' context, teachers' knowledge of teaching pedagogy, and teachers' knowledge of the use and integration of Information and Communication Technology (ICTs). Expert comments ensured the content validity of the present tool, and the split-half reliability (r= .71) indicated good reliability.

Data Analysis

The collected data were analysed by using percentage, t-test, and ANOVA, and accordingly, interpretations were drawn to know the levels of pedagogical content knowledge of social science teachers and also to examine the significant difference of teachers based on sex, school locale, academic qualification, professional qualification, and teaching experience. Percentiles norms were developed and the scores were divided into the following three categories of High Level with scores above the 75th percentile (P75), Moderate Level with scores that lie between the 25th percentile (P25) to 75th percentile (P75), and Low Level with scores below the 25th percentile (P25).

RESULTS

Levels of Social Science Teachers' Pedagogical Content Knowledge

Table 2 highlights the level of pedagogical content knowledge (PCK) of social science teachers and its four components. Table 2 reveals varying levels of the curriculum knowledge possessed by social science teachers. It was found that 23.5 percent of the teachers had a high level of curriculum knowledge, 57 percent had moderate, and 19.5 percent had low curriculum knowledge. Highlighting that the majority of the teachers have moderate curriculum knowledge, with a smaller proportion of them having high or low levels. Further analysis of teachers' knowledge of their learners indicated that 15.5 percent had high knowledge of their learners, 53.5 percent had moderate, and 31 percent were low. Table 2 also shows teachers' knowledge of pedagogy and it was observed that 18 percent of teachers had high, 66.5 percent had moderate, and 15.5 percent were low. Regarding social science teachers' knowledge of the use and integration of ICTs, it was found that 10 percent of teachers had high knowledge of the integration of ICT, in comparison to 75 percent of teachers with moderate knowledge, and 15 percent had low knowledge of integration and use of ICT. Regarding overall PCK, 20 percent of the teachers had high pedagogical content knowledge, the majority of them had moderate PCK with 59 percent, and 21 percent of social science teachers had low pedagogical content knowledge.

Pedagogical Content Knowledge and Sex

Table 3 shows the mean scores of female and male social science teachers teaching at the secondary school, which were 24.12 and 23.72, respectively. The results showed that female teachers had higher mean scores than their counterparts. When tested for significant differences in the mean scores between them, it was observed that the calculated t-value of 1.44< 1.9 (table t-value) and p>.05 indicates that there exists no significant difference between female and male social science teachers in terms of their pedagogical content knowledge.

Pedagogical Content Knowledge (Dimension-wise) and Sex

Table 4 indicates the mean scores of female and male teachers in terms of curriculum knowl-

Table 2: Levels of social science teachers' pedagogical content knowledge

Dimensions of PCK	*Curriculum*	*Learners*	*Pedagogy*	*ICT*	*Total PCK*
Levels					
High	47 (23.5)	31 (15.5)	36 (18)	20 (10)	40 (20)
Moderate	114 (57)	107 (53.5)	133 (66.5)	150 (75)	118 (59)
Low	39 (19.5)	62 (31)	31 (15.5)	30 (15)	42 (21)
Total	200	200	200	200	200

*Value outside the parentheses denotes N, whereas value inside the parentheses is the percentage

Table 3: Mean difference in pedagogical content knowledge (PCK) of female and male social science teachers

Gender	*N*	*Mean*	*SD*	*df*	*Calculated t*	*Table t-value*	*p-value*	*Remarks*
Female	158	24.12	5.2	198	1.44	1.97	.15	Not significant
Male	42	23.72	5.4					

edge, and the Table revealed mean scores of 12.79 for females and 12.71 for males. The calculated t-value of 0.14 was less than the table t-value of 1.97 and p-value of 0.88 was greater than 0.05, indicating no significant difference in the mean scores between female and male teachers with regard to curriculum knowledge. Additionally, Table 4 presents teachers' knowledge of learners, revealing mean scores of 3.18 for female teachers and 3.05 for males. The calculated t-value of 0.61 is less than the table t-value of 1.97, and the p-value of 0.54> 0.05 revealed that there exists no significant difference in the mean scores between female and male social science teachers in relation to the knowledge of learners. Additionally, Table 4 revealed the mean scores of female and male teachers to knowledge of pedagogy were 5.18 and 4.60, respectively. The calculated t-value of 2.25 was greater than the table t-value of 1.97, and the p-value of 0.03 less than 0.05 indicates that there exists a significant difference in the mean scores between female and male teachers with regards to the knowledge of pedagogy, where it was observed that female teachers are better than their counterparts. Further analysis found that the mean scores of female and male teachers concerning knowledge of the use and integration of ICT were 2.96 and 2.67, respectively. The calculated t-value of 1.35 was less than the table t-value of 1.97, and the p-value of 0.55 greater than 0.05 indicates that there exists no significant difference in the mean scores between female and male teachers with regard to the knowledge of integration of ICT.

Pedagogical Content Knowledge and Locale

Table 5 indicates that the mean scores of urban and rural teachers were 23.84 and 23.95, respectively. The t-test result shows that with df of 198, the obtained t-value of 0.036 is less than the table t-value of 1.97, and the p-value is 0.97 > 0.05. It can be concluded that there existed no significant difference between urban and rural teachers in terms of pedagogical content knowledge and hence the null hypothesis of no significant difference is accepted.

Table 4: Mean difference of female and male teachers in the four dimensions of PCK (N=158 female and 42 male)

Dimensions of PCK	*Sex*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remarks*
Curriculum Knowledge	F	12.79	3.09	.14	1.97	.88	Not significant
	M	12.71	3.23				
Knowledge of Learners	F	3.18	1.32	.61	1.97	.54	Not significant
	M	3.05	1.20				
Knowledge of Pedagogy	F	5.18	1.49	2.25	1.97	.03	Significant
	M	4.60	1.53				
Knowledge of the Use	F	2.96	1.25	1.35	1.97	.55	Not significant
and Integration Of ICT	M	2.67	1.26				

*Level of confidence at 0.05 and df of 198

Table 5: Mean difference in PCK of rural and urban social science teachers

Locale	*N*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remark*
Rural	113	23.84	4.83	.036	1.97	.97	Not significant
Urban	87	23.95	5.88				

Pedagogical Content Knowledge (Dimension-wise) and Locale

Table 6 reflects that the mean scores of teachers teaching in urban schools were slightly higher than their counterparts across the dimension of PCK except for teachers' knowledge of the use and integration of ICTs. The t-test result for significant differences in the mean scores was calculated for all dimensions, and the independent sample t-test results revealed that there were no significant differences in the mean scores among social science teachers teaching in rural and urban schools. For curriculum knowledge, the mean scores of rural and urban teachers were 12.75 and 12.80, respectively. The calculated t-value of 0.12 was less than the table t-value of 1.97, and the p-value of 0.90 > 0.05 indicates that there exists no significant difference in the mean scores between rural and urban teachers in relation to curriculum knowledge. The Table also revealed that in relation to the knowledge of learners, the mean scores of rural and urban teachers were 3.11 and 3.22, respectively. The calculated t-value of .61 was less than the table t-value of 1.97, and the p-value of 0.54 > 0.05 indicates that no significant difference exists between rural and urban teachers in relation to the knowledge of learners. For knowledge of pedagogy, the mean scores of rural and urban teachers were 5.03 and 5.10, respectively. The calculated t-value of 0.35 was less than the table t-value of 1.97 and p-value of 0.72 > 0.05. Hence, there exists no significant difference between rural and urban teachers in relation to knowledge of pedagogy. For knowledge of use and integration of ICT, the mean scores of rural and urban teachers were 2.96 and 2.83, respectively. The calculated t-value of 0.71 was less than the table t-value of 1.97 and p-value of 0.47 > 0.05. Hence, the stated null hypothesis that there is no significant difference between rural and urban teachers in relation to knowledge of the use and integration of ICT is accepted.

Pedagogical Content Knowledge and Educational Qualification

On analysing the differences in pedagogical content knowledge of social science teachers based on their educational qualifications, results from Table 7 showed a mean score of 22.68 and 25.49 for graduate and postgraduate, respectively. The obtained t-value of 3.83 is greater than the table t-value of 1.97 with df of 198 at 0.05 level of significance and p-value of 0.00 < 0.05 indicates that there is a significant difference in the mean score of teachers in terms of their educational qualifications, and it was observed that teachers with higher qualifications (postgraduate) had higher mean scores compared to their counterparts.

Differences in Pedagogical Content Knowledge (Dimension-wise) and Educational Qualifications

Table 8 reveals that across the dimensions of PCK, postgraduate teachers had higher mean scores in all four components when compared to their counterparts. A t-test was conducted, and results revealed that when it comes to curriculum knowledge and knowledge of pedagogy, it was found that there existed a significant difference between graduate and postgraduate teachers. It was also evident from the Table that no significant differences exist between graduate and postgraduate teachers in terms of knowl-

Table 6: Mean difference between rural and urban teachers' PCK (dimension-wise) (Rural=113, Urban=87)

Dimensions	*Locale*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remarks*
Curriculum knowledge	Rural	12.75	2.91	.12	1.97	.906	Not significant
	Urban	12.80	3.37				
Knowledge of learners	Rural	3.11	1.34	.61	1.97	.544	Not significant
	Urban	3.22	1.23				
Knowledge of pedagogy	Rural	5.03	1.46	.35	1.97	.724	Not significant
	Urban	5.10	1.60				
Knowledge of integration of ICT	Rural	2.96	1.16	.71	1.97	.476	Not significant
	Urban	2.83	1.36				

*Level of confidence at 0.05 with df of 198

Table 7: Mean difference in overall PCK of social science teachers in terms of educational qualification

Educational qualification	*N*	*Mean*	*SD*	*Calculated t*	*Table t-value*	*p-value*	*Remarks*
Graduate	114	22.68	4.961	3.83	1.97	.000	Significant
Post-Graduate	86	25.49	5.340				

Table 8: Mean differences of graduate and postgraduate teachers in the four dimensions of PCK (Graduate=114, PG=86)

Dimensions	*Educational qualification*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remarks*
Curriculum Knowledge	Graduate	12.20	2.951	2.87	1.97	.003	Significant
	PG	13.53	3.180				
Knowledge of Learners	Graduate	3.02	1.370	1.54	1.97	.083	Not significant
	PG	3.34	1.164				
Knowledge of Pedagogy	Graduate	4.70	1.408	4.04	1.97	.000	Significant
	PG	5.53	1.539				
Knowledge of Integration of ICT	Graduate	2.76	1.214	1.45	1.97	.076	Not significant
	PG	3.08	1.294				

edge of learners and knowledge about the use and integration of ICT. Also, Table 8 revealed that for curriculum knowledge, the mean scores of graduate and postgraduate teachers were 12.20 and 13.53, respectively. The calculated t-value of 2.87 was greater than the table t-value of 1.97, and the p-value of 0.003 < 0.05 indicates that there exists a significant difference in the mean scores between graduate and postgraduate teachers. Additionally, Table 2.6 also revealed that in relation to the knowledge of learners, the mean scores of graduate and postgraduate teachers were 3.02 and 3.34, respectively. The calculated t-value of 1.54 was less than the table t-value of 1.97, and the p-value of 0.083 > 0.05 indicating that no significant difference exists between graduate and postgraduate teachers in terms of knowledge of learners. For knowledge of pedagogy, the mean scores of graduate and postgraduate teachers were 4.7 and 5.53, respectively. The calculated t-value of 4.09 was greater than the table t-value of 1.97 and p-value of 0.000 < 0.05. Hence, it can be concluded that there exists a significant difference between graduate and post-graduate teachers in relation to knowledge of pedagogy. For knowledge of use and integration of ICT, the mean scores of graduate and postgraduate teachers were 2.76 and 3.08, respectively. The calculated t-value of 1.45 was less than the table t-value of 1.97 and p-value of 0.076 > 0.05. Hence, it can be concluded that there exists no significant difference between graduate and postgraduate teachers with regard to the knowledge of use and integration of ICT.

Pedagogical Content Knowledge and Professional Qualification

Table 9 revealed a mean score of 24.76 for professionally qualified and 22.12 for professionally unqualified teachers. The obtained t-value of 3.39 was greater than the table t-value of 1.97 with df of 198 at 0.05 level of significance and p-value of 0.001 < 0.05, indicating that there exists a significant difference in the mean score of teachers in terms of their pedagogical content knowledge. It can be inferred from the analysis that teachers with a B.Ed. degree had better pedagogical content knowledge than their counterparts.

Table 9: Mean difference in PCK of social science teachers in terms of professional qualification

Professional qualification	*N*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remark*
Professionally qualified teacher	136	24.76	5.015	3.39	1.97	.001	Significant
Professionally unqualified teacher	64	22.12	5.459				

Pedagogical Content Knowledge (Dimension-wise) and Professional Qualification

From Table 10, it was observed that professionally qualified teachers had higher mean scores across all dimensions of pedagogical content knowledge compared to those who were not professionally qualified. Additionally, the Table showed the calculated t-value of 3.02, the critical t-value of 1.97, and the p-value of 0.003 < 0.05, which revealed that there exists a significant difference in curriculum knowledge between professionally qualified and unqualified teachers. Furthermore, results showing values of calculated t of 2.01, critical t of 1.97, and p of 0.002 < 0.05, indicate that there exists a significant difference between professionally qualified and unqualified teachers in teachers' knowledge of learners. Results from the Table also showed the calculated t value of 2.19, which is higher than the table t value of 1.97, and the p-value of 0.047 < 0.05 for knowledge of pedagogy revealed there existed a significant difference between professionally qualified and unqualified teachers. However, from the Table, it was observed that for the knowledge of use and integration of ICT, the calculated-t of 1.47, table t value of 1.97, and the p-value of 0.078 > 0.05 indicates that there exist no significant differences between professionally qualified teachers and their counterparts for knowledge of use and integration of ICT.

Teachers' Pedagogical Content Knowledge and Teaching Experience

Table 11 reflects the mean scores of teachers in pedagogical content knowledge, and the result revealed that experienced teachers had higher mean scores of 24.83, followed by less experienced teachers of 23.13 and novice teachers of 22.50. Analysis of Table 11 revealed that for curriculum knowledge, knowledge of learners, and knowledge of integration of ICT, the mean scores

Table 10: Mean difference between qualified and unqualified teachers' PCK (dimension-wise) (professionally qualified=136, not qualified=64)

Dimensions	*Professional Qualification*	*Mean*	*SD*	*Calculated t*	*Table t*	*p-value*	*Remarks*
Curriculum knowledge	Qualified	13.24	2.86	3.02	1.97	.003	Significant
	Unqualified	11.83	3.39				
Knowledge of learners	Qualified	3.28	1.36	2.01	1.97	.002	Significant
	Unqualified	2.91	1.12				
Knowledge of pedagogy	Qualified	5.22	1.54	2.19	1.97	.047	Significant
	Unqualified	4.73	1.43				
Knowledge of integration of ICT	Qualified	3.02	1.24	1.47	1.97	.078	Not significant
	Unqualified	2.65	1.25				

Table 11: Descriptive statistics (dimension-wise)

Dimensions	*Years of teaching experience*	*N*	*Mean*	*SD*
Pedagogical Content Knowledge	Novice (3 years and below)	18	22.50	6.36
	Less experienced (4-10)	86	23.13	5.34
	Experienced (11 and above)	96	24.83	4.92
Curriculum Knowledge	Novice (3 years and below)	18	11.78	3.32
	Less experienced (4-10)	86	12.33	3.31
	Experienced (11 and above)	96	13.39	2.78
Knowledge of Learners	Novice (3 years and below)	18	2.94	1.43
	Less experienced (4-10)	86	2.93	1.26
	Experienced (11 and above)	96	3.38	1.23
Knowledge of Pedagogy	Novice (3 years and below)	18	5.11	1.81
	Less experienced (4-10)	86	5.07	1.37
	Experienced (11 and above)	96	5.04	1.60
Knowledge of Integration of ICT	Novice (3 years and below)	18	2.67	1.28
	Less experienced (4-10)	86	2.80	1.29
	Experienced (11 and above)	96	3.03	1.22

of experienced teachers were higher than their counterparts. Meanwhile, for knowledge of pedagogy, it was observed that novice teachers had a better mean score of 5.11 than less experienced and experienced teachers, whose mean scores were 5.07 and 5.04, respectively.

Pedagogical Content Knowledge (Dimension-wise) and Teaching Experience

Analysing Table 12 revealed that for pedagogical content knowledge, the computed F value of 3.09 was greater than the table F (df 2/197) value of 3.04 at 0.05 level of confidence and p-value of 0.48 < 0.05, indicating that there existed a significant difference in pedagogical content knowledge of social science teacher based on their teaching experience. The analysis further revealed that in terms of curriculum knowledge and knowledge of learners, there existed a significant difference between the three categories of teachers based on their teaching experience. The computed F values of 3.78 and 3.07 respectively, and the p-values of .024 and .048<.05 respectively, indicate the significant differences. However, for knowledge of pedagogy and knowledge of the use and integration of ICT, the calculated F value of .019 and 1.09 respectively, and p-value of .981 and .336 respectively, indicate that there existed no significant differences among the three categories of teachers based on teaching experiences in terms of knowledge of pedagogy and knowledge and use of ICT.

Relationship Between Teachers' Pedagogical Content Knowledge and Teaching Experience

Table 13 revealed a correlation of .169 between teachers' pedagogical content knowledge and teaching experience. Therefore, rejecting the null hypothesis at .05 level of confidence, it can be stated that a significant relationship exists between teachers' pedagogical content knowledge and their teaching experience. It was observed that more experienced teachers had higher pedagogical content knowledge scores than their counterparts with fewer years of experience.

DISCUSSION

Findings of the study reflected that many teachers teaching social science, had a moder-

Table 12: Hypothesis testing

PCK and its dimensions		*Sum of squares*	*df*	*Mean square*	*F*	*Sig.*
Pedagogical Content Knowledge (Overall)	Between groups	170.154	2	85.077	3.093	.048
	Within groups	5419.426	197	27.510		
	Total	5589.580	199			
Curriculum Knowledge	Between groups	71.021	2	35.510	3.780	.024
	Within groups	1850.734	197	9.395		
	Total	1921.755	199			
Knowledge of Learners	Between groups	9.769	2	4.885	3.074	.048
	Within groups	313.026	197	1.589		
	Total	322.795	199			
Knowledge of Pedagogy	Between groups	.087	2	.044	.019	.981
	Within groups	459.193	197	2.331		
	Total	459.280	199			
Knowledge of Integration of ICT	Between groups	3.454	2	1.727	1.096	.336
	Within groups	310.546	197	1.576		
	Total	314.000	199			

Table 13: Correlation between variables

		PCK total scores	*Teaching Experience (in Years)*
PCK total scores	Pearson Correlation	1	.169*
	Sig. (2-tailed)		.017
	N	200	200

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

ate level of pedagogical content knowledge (PCK). At the same time, a significant percentage of them exhibited low pedagogical content knowledge. The finding is similar to the observation reported by Moh'd et al. (2021) that the majority of the teachers had moderate levels of pedagogical content knowledge. The present findings also revealed that a notable proportion of teachers possessed high pedagogical content knowledge, which suggested that teachers who had a stronger understanding of both the subject and how to teach it were able to create more engaging and relatable lessons (Brijlall 2014). Current findings also reported that some teachers had low pedagogical content knowledge, and they need to enhance their knowledge. This is consistent with the findings of Eggen and Kauchak (as cited in Adediwura and Tayo 2007), who observed that teachers who lacked pedagogical content knowledge, paraphrased information, or provided abstract explanations that were not meaningful to their students (Putra et al. 2024). This raises concern regarding teacher preparedness, addressing this issue, teacher education programmes must enhance teachers' pedagogical content knowledge through comprehensive training that integrates subject matter knowledge with effective pedagogical strategies. Furthermore, professional development opportunities can also support teachers in continuously improving their pedagogical content knowledge throughout their careers. Furthermore, the findings revealed that the majority of social science teachers have a moderate level of knowledge in terms of curriculum, their students, pedagogy, and ICT integration. While some teachers exhibited strong expertise in curriculum knowledge, fewer teachers excel in ICT integration. On the other hand, a significant number of them have low knowledge when it comes to understanding their students. Similar to the present findings, Bakar et al. (2022) revealed that the majority of teachers possessed adequate content and pedagogical knowledge, however, their ICT knowledge was limited. Also, in line with the current findings that teachers struggled to integrate ICT, Karunakaran and Dhanawardana (2023) in their study found that social science teachers face challenges in integrating ICT into the teaching-learning process due to limited professional development opportunities and insufficient technological resources.

The present findings reflected that there was no significant difference in pedagogical content knowledge between male and female teachers. Additionally, the findings revealed that both female and male teachers have similar levels of curriculum knowledge, understanding of learners, and ICT integration. However, in pedagogical knowledge, female teachers outperformed their male counterparts, showing a significantly higher knowledge of pedagogy. This aligns with Odumosu and Fisayi (2018), who reported no significant difference in the levels of teachers' pedagogical content knowledge in terms of subject matter knowledge, and knowledge of students' understanding on the basis of sex. Similarly, Ghanney and Agyei (2021) reported no notable significant differences based on sex and location except in ICT integration. Kucukaydin and Ulucinar (2016) also found no notable differences in pedagogical content knowledge based on gender, indicating that pedagogical content knowledge components were consistent across genders, emphasising that both male and female teachers demonstrated comparable levels of pedagogical understanding and skills. Regarding ICT integration, the present study revealed male teachers have an advantage. However, Aksu (2019) found that there are no gender differences in the use of ICT by teachers. However, he identified that the major concerns and problems in the use of ICT tools by teachers include lack of technological infrastructure, rigid timetable, fixed curriculum, low technical support, lack of effective training, and lack of competencies and motivation on the part of teachers in the use of ICT as common challenges. Contrastingly, Buabeng-Andoh (2012) reported that female teachers use ICT more than their male counterparts, which highlighted the need to consider factors such as access to resources, training opportunities, and institutional support when evaluating ICT integration among teachers.

The findings of the study on pedagogical content knowledge and school locale revealed that the mean scores of teachers teaching in urban schools were higher than their counterparts, however, when tested for difference, no significant difference was observed between teachers teaching in rural and urban schools. Additionally, the findings highlighted that while urban teachers had slightly higher scores than their

rural counterparts in knowledge of curriculum, learners and pedagogy the differences were not significant. On similar lines, Patra and Guha (2017) found that the pedagogical content knowledge of secondary teachers teaching geography in West Bengal does not differ in terms of school locale. Also, Kultsum (2017) highlighted that while urban teachers had access to more resources, the pedagogical content knowledge levels were not significantly different from those of rural teachers. However, Kucukaydin and Ulucinar (2016) found that urban teachers displayed higher levels of subject matter knowledge and pedagogical strategies compared to their rural counterparts, which could be attributed to professional development opportunities and access to educational resources.

Regarding teachers' pedagogical content knowledge and educational qualification, findings indicated that there was a significant difference in teachers' pedagogical content knowledge based on educational qualification. It was found that teachers with postgraduate degrees demonstrated higher pedagogical content knowledge. Further analysis revealed that postgraduate teachers outperformed their counterparts in terms of curriculum knowledge and pedagogical knowledge. However, no significant differences were observed between the two groups concerning the knowledge of learners and the use and integration of ICTs. Dora and Mohalik (2017) found that teachers having higher qualifications exhibited better pedagogical content knowledge. Putra et al. (2024) also reported teachers who had higher educational qualifications had more pedagogical skills than those with less qualifications. Likewise, Blomeke et al. (2016) found that teachers with higher educational qualifications in subject knowledge and pedagogy demonstrated more effective teaching practices and better student outcomes. However, Shing et al. (2015) and Patra and Guha (2017) found no significant difference in teachers' pedagogical content knowledge based on their educational qualifications, the studies stated that as specialised knowledge of teaching, pedagogical content knowledge is also influenced by factors such as personal learning experiences, beliefs, conceptions of teaching and learning, teaching preferences, reflection, and interactions with students, rather than by formal educational background alone.

Analysis of pedagogical content knowledge (PCK) and its dimensions to professional qualifications revealed that qualifications significantly impacted overall pedagogical content knowledge and most dimensions, except for the knowledge of the use and integration of ICT, where the results were insignificant. Consistent with these findings, Dora and Mohalik (2017) noted that B.Ed. teachers generally perform better than D.El.Ed. teachers in content delivery and understanding of learners and their contexts. Similarly, Aksu (2019) observed that pre-service teachers often fail to identify the sources of students' mistakes and suggest appropriate solutions. Adams et al. (2023) also pointed out that professional development had positive impacts on the pedagogical content knowledge of teachers. Likewise, Becerra et al. (2023) supported that those teachers who had participated in a professional development programme had better PCK than their counterparts. In contrast, Patra and Guha (2017) found no impact of professional qualifications on teachers' pedagogical content knowledge. The study highlighted that although professional development is essential for enhancing pedagogical content knowledge, practical teaching experience plays a more crucial role in its development.

Analysis of pedagogical content knowledge (PCK) to teaching experience showed that experience significantly influences overall pedagogical content knowledge, curriculum knowledge, and learners' knowledge. However, it did not significantly impact knowledge of pedagogy or the use and integration of ICT. Consistent with these findings, studies have indicated that experienced teachers can better notice and interpret classroom situations than novice teachers (Konig and Kramer 2016), revealing a positive correlation between teachers' pedagogical content knowledge and teaching experience. Also, confirming the present findings, Friedrichsen et al. (2009) found that teaching experience plays a critical role in pedagogical content knowledge development as it facilitates integration among the components of pedagogical content knowledge. Likewise, Smit et al. (2023) acknowledged the need for curriculum knowledge and teaching experience for strong PCK. Contradicting the above findings, Harris and Sass (2011) revealed that although a teacher's pedagogical content

knowledge is significantly associated with student gain and achievement, teaching experience is more strongly associated with student achievement than pedagogical content knowledge.

The findings of the study highlighted the significant influence of teachers' characteristics, specifically their academic qualifications, professional qualifications, and teaching experience on their levels of pedagogical content knowledge. This highlights the necessity for designing professional development courses that address these factors, which could enhance teachers' knowledge and skills. By recognising the diverse backgrounds of teachers, these programmes can provide individualised support that can address their specific strengths and weaknesses, which not only strengthens teachers' pedagogical content knowledge but also enhances student learning outcomes by equipping them with the knowledge and skills necessary to engage students effectively in the learning process.

CONCLUSION

According to the study, most social science teachers had moderate pedagogical content knowledge levels across all dimensions. On the other hand, a sizable portion of them were found to have low pedagogical content knowledge levels. According to the survey, there was no discernible variation in the pedagogical content knowledge levels of teachers according to gender or school location. However, based on years of teaching experience, professional certification, and educational background, notable variations in the pedagogical content knowledge levels of teachers were found. Thus, it can be said that a teacher's pedagogical subject knowledge varies depending on several aspects, including their professional and academic background and their length of teaching experience. Additionally, it was evident from the strong and positive link between pedagogical content knowledge and teaching experience that more experienced teachers typically possess higher levels of pedagogical content knowledge. Overall, the current study's intriguing findings showed that while factors like experience and qualification were found to have an impact, structural demographic features like sex and location had little bearing on teachers' pedagogical content knowledge.

RECOMMENDATIONS

The present study found that a substantial number of teachers had low pedagogical content knowledge, thereby emphasising the need for targeted professional development programs that enhance teachers' pedagogical content knowledge. The study suggested that teachers differed in their pedagogical content knowledge based on their characteristics. Therefore, individualised short-term training courses might be offered to teacher trainees based on their interests. Educational policies may need to reflect the importance of pedagogical content knowledge in teacher evaluations and hiring practices, ensuring that educators possess the necessary skills to improve student outcomes. By focusing on these implications, educational stakeholders can work towards improving teaching effectiveness and ultimately enhancing student learning outcomes in social sciences.

LIMITATION OF THE STUDY

The current study sample contains unequal groups for every comparison, which could impact the tests' statistical power in the current investigation.

ACKNOWLEDGEMENT

The authors extend their sincere appreciation to all the principals and heads of the schools and the teachers concerned for their consent and necessary support required for the study.

REFERENCES

Adams AK, Asemnor F, Nkansah V, Adonu H 2023. The impact of professional development on the pedagogical content knowledge of the mathematics teacher. *Asian Journal of Advanced Research and Report*,17(3): 19-28. https://doi.org/10.9734/ajarr/2023/v17i3470

Adediwura AA, Tayo B 2007. Perception of Teachers' Knowledge, Attitude and Teaching Skills as Predictor of Academic Performance in Nigerian Secondary Schools. Educational Research and Reviews, 2(7): 165-171. From <https://academicjournals.org/journal/ERR/article-full-text-pdf/EC377823498> (Retrieved on 21 October 2024).

Aksu Z 2019. Pre-service Mathematics Teachers' Pedagogical Content Knowledge Regarding Student Mistakes on the Subject of Circle. International Journal of Evaluation and Research in Education, 8(3): 440-445. From <https://doi.org/10.11591/ijere.v8i3.20250 https://ijere.iaescore.com/index.php/IJERE/article/view/20250> (Retrieved on 20 October 2024).

Anney VN, Hume AC 2014. Enhancing Untrained Science Teachers' Pedagogical Content Knowledge (PCK) In Developing Countries Through Teachers' Professional Learning Communities (Plcs). International Journal Of Development And Sustainability, 3(8): 1709-1744. From <https://isdsnet.com/ijds-v3n8-8.pdf> (Retrieved on 9 March 2025).

Bakar A, Adams FH, Tetteh-Osei F, Ochour BK, Ansah PO, Asabere IK 2022. Teachers' Technological, Pedagogical and Content Knowledge in the Junior High School Social Studies Curriculum. Universal Journal of Social Sciences and Humanities, 2(1): 34-45. From <https://www.scipublications.com/journal/index.php/ujssh/article/view/301> (Retrieved on 8 March 2025).

Ball DL,McDiarmid GW 1989. The Subject Matter Preparation of Teachers. East Lansing, Michigan: National Center for Research on Teacher Education. From <https://www.researchgate.net/profile/GMcdiarmid/publication/313078705_The_subject_matter_ preparation_of_teachers'/links/5f3812fa458515b72924522d/The-subject-matter-preparation-of-teachers.pdf> (Retrieved on 15 October 2024).

Ball DL, McDiarmid GW 1990. The Subject-Matter Preparation Of Teachers. In: WR Houston, MHJ Sikula (Eds.): Handbook of Research on Teacher Education. New York: Macmillan, pp. 437-449. From <https://narst.org/research-matters/pedagogical-content-knowledge> (Retrieved on 9 March 2025).

Ball DL, Thames MH, Phelps G 2008. Content knowledge for teaching: What makes it special? *Journal of Teacher Education*, 59(5): 389-407. https://doi.org/10.1177/0022487108324554

Becerra B, Nunez, P Vergara, C Santibanez, D Kruger D, Cofre H 2023. Developing an instrument to assess pedagogical content knowledge for evolution. *Research in Science Education*, 53(2): 213-229. https://doi.org/10.1007/s11165-022-10042-0

Blomeke S, Olsen RV, Suhl U 2016. Relation of Student Achievement to the Quality of Their Teachers and Instructional Quality. Teacher Quality, Instructional Quality and Student Outcomes, 2: 21-50. From <https://library.oapen.org/bitstream/handle/20.500.12657/27946/1002053.pdf?sequence#page=29> <Retrieved on 9. March 2025)

Brijlall D 2014. Exploring the pedagogical content knowledge for teaching probability in middle school: A South African case study. *International Journal of Educational Sciences*, 7(3): 719-726.

Buabeng-Andoh C 2012. Factors Influencing Teachers' Adoption and Integration of Information and Communication Technology Into Teaching: A Review of the Literature. International Journal of Education and Development using ICT, 8(1): 136-155. From <https://www.learntechlib.org/p/188018> (Retrieved on 21 February 2025).

Choudhury A 2022. Disciplines of Social Sciences and Their Interrelationships. Economics, 10(8):33-38 From <https://www.raijmr.com/ijrhs/wpcontent/uploads/2023/03/IJRHS_2022_vol10_issue_08_06.pdf> (Retrieved on 21 February 2025).

Dora MPS, Mohalik R 2017. Uses of pedagogical content knowledge (PCK) by social science teachers in classroom transactions at elementary level. *International Journal of Social Sciences and Humanities Invention*, 4(8): 3737-3742. DOI:10.18535/ijsshi/v4i10.12

Etkina E 2010. Pedagogical Content Knowledge and Preparation of High School Physics Teachers. Physical Review Special Topics—Physics Education Research, 6(2): 1-26. From <https://journals.aps.org/prper/cited-by/10.1103/PhysRevSTPER.6.020110> (Retrieved on 20 October 2024).

Evens M, Elen J, Depaepe F 2015. Developing Pedagogical Content Knowledge: Lessons Learned From Intervention Studies. Education Research International, 2015(1): Article id 790417 (23 pages). From <https://www.researchgate.net/publication/281097382> (Retrieved on 18 October 2024).

Friedrichsen PJ, Abell SK, Pareja EM, Brown PL, Lankford DM, Volkmann MJ 2009. Does teaching experience matter? Examining biology teachers' prior knowledge for teaching in an alternative certification program. *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching*, 46(4): 357-383. https://doi.org/10.1002/tea.20283

Fukaya T, Uesaka Y 2023. Spontaneous use of PCK to teach mathematics among elementary school teachers: A comparison with junior and senior high school teachers. *SN Social Sciences*, 3(6): 94. https://doi.org/10.1007/s43545-023-00685-9

Gess-Newsome J, Taylor JA, Carlson J, Gardner AL, Wilson CD, Stuhlsatz MA 2019. Teacher pedagogical content knowledge, practice, and student achievement. *International Journal of Science Education*, 41(7): 944-963. https://doi.org/10.1080/09500693.2016.1265158

Ghanney RA, Agyei EB 2021. Social studies teachers' pedagogical content knowledge and its influence on their assessment practices in junior high schools in the west Akim municipality, Ghana. *European Journal of Education Studies*, 8(8): (38-59) http://dx.doi.org/10.46827/ejes.v8i8.3833

Gudmundsdottir S, Shulman L 1987. Pedagogical content knowledge in social studies. *Scandinavian Journal of Educational Research*, 31(2): 59–70. https://doi.org/10.1080/0031383870310201

Harris DN, Sass TR 2011. Teacher training, teacher quality, and student achievement. *Journal of Public Economics*, 95(7-8): 798-812. https://doi.org/10.1155/2015/790417

Jacob Filgona, John Sakiyo, Gwany DM 2020. Teachers' Pedagogical Content Knowledge and Students' Academic Achievement: A Theoretical Overview. Journal of Global Research in Education and Social Science, 14(2): 14-44. From <https://mail.ikprress.org/index.php/JOGRESS/article/view/5405> (Retrieved on 21 October 2024).

Jones A, Moreland J 2004. Enhancing Practicing Primary School Teachers' Pedagogical Content Knowledge in

Technology. International Journal of Technology and Design Education, 14: 121-140. From<https://www.researchgate.net/publication/226950985> (Retrieved on 21 October 2024).

Karunakaran S, Dhanawardana R 2023. Integration of ICT in the teaching-learning process: Challenges and issues faced by social science teachers. *European Journal of Education and Pedagogy*, 4(4): 24-30. https://doi.org/10.24018/ejedu.2023.4.4.696

Kilic H 2009. Pedagogical Content Knowledge of Preservice Secondary Mathematics Teachers. Doctoral Dissertation. USA: University of Georgia. From <https://getd.libs.uga.edu/pdfs/kilic_hulya_200908_phd.pdf> (Retrieved on 15 October 2024).

König J, Kramer C 2016. Teacher professional knowledge and classroom management: On the relation of general pedagogical knowledge (GPK) and classroom management expertise (CME). *ZDM*, 48: 139-151. https://doi.org/10.1007/s11858-015-0705-4

Kucukaydin MA, Ulucinar Sagir S 2016. An Investigation of Primary School Teachers' Pedagogical Content Knowledge Towards Science Subjects Using an Inquiry-Based Approach. International Electronic Journal of Elementary Education, 9(1): 87-108. From <https://files.eric.ed.gov/fulltext/EJ1126636.pdf> (Retrieved on 22 October 2024).

Kultsum U 2017. The Concept of Pedagogical Content Knowledge (PCK): Recognizing the English Teachers' Competences in Indonesia. In: *2nd International Conference on Innovative Research Across Disciplines (ICIRAD 2017)*. 26 August 2017, Sanur, Indonesia, pp. 55-59. https://doi.org/10.2991/icirad-17.2017.11

Magnussen S, Krajcik, Joseph, Borko Hilda 1999. Nature, sources, and development of pedagogical content knowledge for science teaching. In: J Gess-Newsome, NG Lederman (Eds.): *Examining Pedagogical Content Knowledge: The Construct And Its Implications For Science Education*. Netherlands: Kluwer Academic Publishers, pp. 95-132. DOI:10.1007/0-306-47217-1_4

Monte-Sano C, Budano C 2013. Developing and Enacting Pedagogical Content Knowledge for Teaching History: An Exploration of Two Novice Teachers' Growth over Three Years. Journal of the Learning Sciences, 22(2): 171-211. From <https://www.learntechlib.org/p/167794/> (Retrieved on 9 March 2025).

Maryani I, Martaningsih ST 2015. Correlation between teacher's PCK (pedagogical content knowledge) and student's motivation in primary school. *International Journal of Evaluation and Research in Education*, 4(1): 38-44. http://doi.org/10.11591/ijere.v4i1.4490

Mishra L 2021. A framework of pedagogical content knowledge on arithmetic for primary school teachers. *Multicultural Education*, 7(4): 101-108. DOI 10.5281/zenodo.4679591

Mizzi E 2024. Pedagogical content knowledge in school economics. *Citizenship, Social and Economic Education*, 23(3): 127-143. https://doi.org/10.1177/14788047241276192

Moh'd SS, Uwamahoro J, Nzotungicimpaye J, Orodho JA 2021. Assessing the level of secondary mathematics teachers' pedagogical content knowledge. *Eurasia Journal of Mathematics, Science and Technology Education*, 17(6): 1-11. https://doi.org/10.29333/ejmste/10883

National Council of Educational Research and Training 2005. National Curriculum Framework. From <https://ncert.nic.in/nc-framework.php> (Retrieved on 15 October 2024)

Odumosu O, Fisayi A 2018. Teachers' Content and Pedagogical Knowledge on Students' Achievement in Algebra. International Journal of Education and Research, 6(3): 83-94. From <https://ijern.com/journal/2018/March-2018/11.pdf> (Retrieved on 19 October 2024).

Patra A, Guha A 2017. Comparative Study on Geography Teachers' Pedagogical Content Knowledge and Self-Efficacy in West Bengal, India. Quest Journals Journal of Research In Humanities And Social Science, 5(3): 68-71. From <http://www.questjournals.org/> (Retrieved on 19 October 2024).

Prasad I 2008. Social Sciences and the National Curriculum Framework. Learning Curve, 15: 36-38. From <https://publications.azimpremjiuniversity.edu.in/id/eprint/749> (Retrieved on 15 October 2024).

Putra MJA, Natuna, DA Syaflita, D Arianto, J Tiana, EA, Suryana 2024. Elementary teachers' understanding of pedagogical content knowledge analysis disaster mitigation: Stories from Indonesia. *International Journal of Evaluation and Research in Education*, 13(1): 31-42. https://doi.org/10.11591/ijere.v13i1.24642

Rollnick M, Mavhunga E 2016. The place of subject matter knowledge in teacher education. In: J Loughran, M Hamilton (Eds.): International Handbook of Teacher Education. Singapore: Springer, pp. 423-52. From <https://link.springer.com/chapter/10.1007/978-981-10-0366-0_11> (Retrieved on 24 October 2024).

Roy S, Roy R 2015. Pedagogical Content Knowledge: An Emerging Issue in Preparing Teachers. Scholarly Research Journal for Interdisciplinary Studies, 4(13): 410-422. From <https://www.researchgate.net/publication/343975653_pedagogical_content_knowledge_an_emerging_issue_in_ preparing_teachers> (Retrieved on 18 October 2024).

Sarif MN, Khardewsaw M, Vandana 2020. A Qualitative Study of Students' Interest, Learning Difficulty, and Teachers' Teaching Methods in Geography in Secondary Schools of Meghalaya. Journal of Indian Education, 128–144. From <https://www.researchgate.net/publication/353130954_A_Qualitative_Study_of_Students%27_Interest_Learning_Difficult y_and_ Teachers%27_Teaching_methods_in_Geography_in_Secondary_Schools_of_meghalaya> (Retrieved on 24 October 2024).

Shing CL, Saat RM, Loke SH 2015. The Knowledge of Teaching "Pedagogical Content Knowledge (PCK). MOJES: Malaysian Online Journal of Educational Sciences, 3(3): 40-55. From <https://mojes.um.edu.my/index.php/MOJES/article/view/12781/8206> (Retrieved on 2 November 2024).

Shulman LS 1986. Those Who Understand: Knowledge Growth in Teaching. Educational Researcher, 15(2): 4-14. From <https://journals.sagepub.com/doi/abs/10.3102/0013189X015002004> (Retrieved on 24 October 2024).

Shulman L 1987. Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review*, 57(1): 1-23. https://doi.org/10.17763/haer.57.1.j463w79r 5645 5411

Smit E, Tuithof H, Savelsbergh E, Béneker T 2023. Geography teachers' pedagogical content knowledge: A systematic review. *Journal of Geography*, 122(1): 20-29. https://doi.org/10.1080/00221341.2023.2173796

Tuithof H, Van Drie J, Bronkhorst L, Dorsman L, Van Tartwijk J 2023. Teachers' pedagogical content knowledge of two specific historical contexts captured and compared. *Educational Studies*, 49(4): 686-711. https://doi.org/10.1080/03055698.2021.1877621

Paper received for publication in November, 2024
Paper accepted for publication in December, 2024