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INVESTIGATING TEACHERS' PERCEIVED USE OF TEACHING AND LEARNING MATERIALS IN TEACHING CONTENT IN INCLUSIVE BASIC SCHOOLS IN GHANA

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ABSTRACT

This study investigated teachers' perceived use of teaching and learning materials in inclusive classrooms. Based on the framework of Technological Pedagogical Content Knowledge (TPACK), the purpose is to determine teachers' perceived use of teaching and learning materials in the teaching of mathematics, social studies, science and literacy skills in inclusive basic schools. One hundred and forty-five participants were randomly surveyed from 35 inclusive pilot schools in Ghana. A (TPACK) instrument consisting of 47 items with Cronbach's reliability coefficient; ranged from .75- .92 for the seven TPACK subscales were used for data collection. The Pearson correlation and t-test were used to analyze the data. The results revealed that there was a significant correlation between perceived use of TLM and TPACK variables. Significant differences were noted between male and female teachers' perceived use of TLM in mathematics and social studies. However, no difference was found in the use of TLM between the special educators and general educators. It was recommended that teacher education institutions should provide additional planning time for pre-service teachers to experiment with variety of teaching and learning materials in teaching mathematics, social studies, science, and literacy skills.

Keywords: Teaching and learning materials, Technological, Pedagogical, Content, Knowledge.

1. INTRODUCTION

Teaching is a complicated practice that requires an interweaving of many kinds of specialized knowledge. In this way, teaching is an example of ill-structured discipline, requiring teachers to apply complex knowledge structures across different cases and contexts (Mishra and Koehler, 2006). Koehler and Mishra (2009) observed that teachers practice their craft in highly complex, dynamic classroom contexts that require them to constantly shift and evolve their understanding. Thus, knowledge from different domains including knowledge of student's thinking and learning,

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knowledge of subject matter, and knowledge of the use of teaching and learning materials (educational technology) are critical.

Teaching and learning materials are one of the components of educational technology. From the general didactic aspect, teaching and learning materials can be defined as the didactically adapted materials that the teacher can use during the teaching process to help the student in the understanding of the content. Teaching and learning materials are sometimes referred to as teaching aids, learning materials, learning resources and educational materials. They are all the specially prepared technological materials intended to be used in the teaching and learning process. These consist of both electronic (computers, digital media or online) and non-electronic materials (printed materials, and non-printed objects). Both electronic and non-electronic materials are indispensable in the teaching process, since they are, in addition to the teacher's direct explanation, and other learning activities; serve as an important source for students' learning.

In a classroom setting, a crucial factor for a successful integration of educational technology into teaching is the teacher because she/he directly determines the best instructional practices for the students (Hite, 2005). Given that teachers are the instructional drivers in the classroom, it is important to help prepare teachers in acquiring technological expertise to better facilitate the learning of the diverse students in the classroom (Pan and Carroll, 2008).

Many researchers agree that the use of teaching and learning materials for instructional purposes can improve students' learning and create robust method of content delivery for teachers (O'Bannon and Judge, 2004; Hite, 2005). In the current digital age, it is astonishing that the use of technology in the public schools appears to be so limited, despite increasing investment by education authorities in the acquisition of teaching and learning materials, including laptop computers for schools. But why are teachers so reluctant in the use of teaching and learning materials when they can greatly assist them? One possible reason for the lack of enthusiasm towards the use of teaching and learning materials to enhance student-centered pedagogy could be due to the view point teachers hold (Neiderhauser and Stoddart, 2001). For example, Chen (2008) stated that teachers refer to their pre-existing beliefs, and experiences, when trying to integrate educational technology into their instructional practices. These pre-existing beliefs can influence the development of additional beliefs regarding the use of teaching and learning materials in the instructional practices. In a study, examining the level of technology instruction teachers received during their pre-service preparation, Littrell *et al.* (2005) concluded that instruction was more about technology rather than adequately preparing future teachers on how to use technology. Hernández-Ramos (2005) further states that students exposed to technology use in pre-service education programmes are knowledgeable in the use of teaching and learning materials.

Shulman (1986) believed that good pedagogical processes must involve presenting the learners with enabling learning situations. These situations in which learners experience in the broadest sense of the term, try things out to see what happens, manipulate symbols, pose questions and seek their own answers. A good classroom teacher needs to help the students to develop the spirit of enquiry through various simulative teaching and learning materials.

1.1. Theoretical Framework

Technological Pedagogical Content Knowledge (TPACK) was introduced to educational research field as a theoretical framework for understanding teachers' knowledge required for effective technology integration (Mishra and Koehler, 2006). This model consists of three overlapping spheres of Knowledge; Technology knowledge, Pedagogical Knowledge, and Content. Pedagogical Content Knowledge attempts to make visible the interplay of three primary forms of knowledge: Content (CK), Pedagogy (PK) and Technology TK). From this model are seven components. They are defined as:

1.1.1Technology knowledge (TK): Technology knowledge refers to the knowledge about various technologies raging from low technologies to digital technologies such as the internet, digital video, interactive whiteboards, and software programmes.

1.1.2 Content knowledge (CK): It is the knowledge about actual subject matter that is to be learnt or taught (Mishra and Koehler, 2006). Teachers must know about the content they are going to teach and how the nature of knowledge is different for various content areas.

1.1.3 Pedagogical knowledge (PK): Pedagogical knowledge refers to the methods and processes of teaching and it includes knowledge in classroom management, assessment, lesson plan development, and student learning.

1.1.4 Pedagogical content knowledge (PCK): Pedagogical content knowledge refers to knowledge that deals with the teaching process (Shulman, 1986). Pedagogical content knowledge is different for various content areas, as it blends both content and pedagogy with the goal being to develop better teaching practices in the content areas.

1.1.5 Technological content knowledge (TCK): Technological content knowledge refers to knowledge of how technology can create new representations for new content. It suggests that teachers understand that by using a specific technology, they can change the way learners practice and understand concepts in a specific content area.

The overlap of these spheres results in Pedagogical Content Knowledge (PCK), Technological Pedagogical Knowledge (TPK), and Technological Content Knowledge (TCK). At the heart of this framework where all three knowledge spheres overlap, is the fusion of Technological Pedagogical Content Knowledge (TPACK). This model builds upon Shulman (1986) ideas.

1.1.6 Technological pedagogical knowledge (TPK): Technological pedagogical knowledge refers to the knowledge of how various technologies can be used in teaching, and to understanding that using technology may change the way teachers teach.

1.1.7 Technological pedagogical content knowledge (TPACK): Technological pedagogical content knowledge is the knowledge required by teachers to integrate technology into their teaching in any content area. Teachers have an intuitive understanding of the complex interplay between the three basic components of knowledge (CK, PK, TK) by teaching content using appropriate pedagogical methods and technologies.

Figure- 1. The components of the TPACK framework (graphic from http://tpack.org)

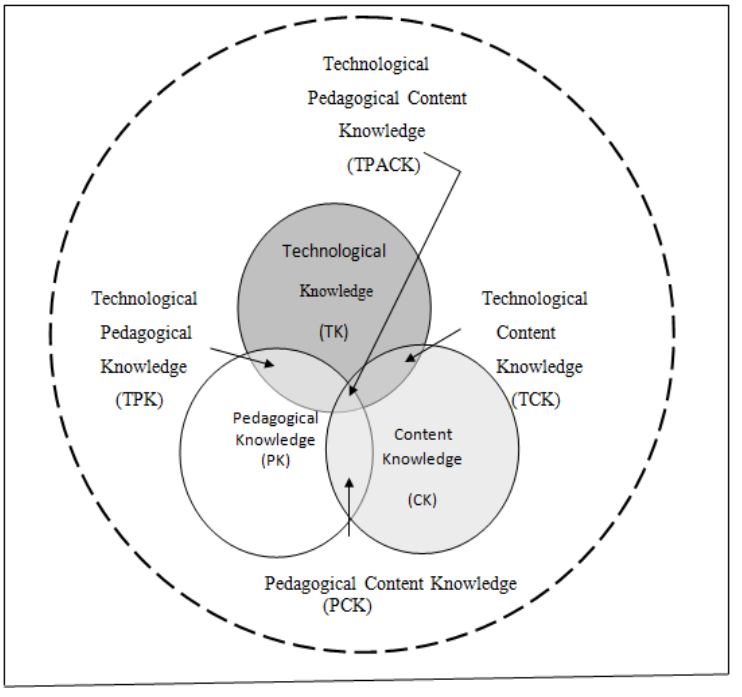

Figure 1 depicts the TPACK components which provided the framework for effectively integrating technology through curriculum planning. TPACK enables the teacher to successfully incorporate technology in teaching by enabling the teacher to develop, appropriate, context-specific strategies and representations. TPACK involves understanding and identifying (a) the use of appropriate technology, (b) in a particular content area, (c) as part of a pedagogical strategy, (d) within a given educational context, and (e) to develop students' knowledge of a particular topic or meet an educational objective or students needs (Cox, 2008).

From the current body of literature on TPACK, it seems that the TPACK framework provides a promising way forward for successfully integrating technology through curriculum planning. Further, it has been argued that TPACK is a helpful framework for studying the development of teacher knowledge about technology (Koehler *et al.*, 2007).

2. STATEMENT OF THE PROBLEM

Despite the initiatives, and recommendations by the Government of Ghana on the use of teaching and learning technologies in the schools, it appears that these technologies are not fully and effectively used by the teachers in teaching mathematics, social studies, science, and literacy skills. This observation is supported by Wallace (2001) who found in a study that educational technologies especially computers are not being used sufficiently by the school teachers. The implementation of the use of educational technologies in the teaching and learning process in the Ghanaian inclusive education schools has not been guided by research. Attempts to foster the use of teaching and learning technologies among individual teachers, continues to be a challenge for school administrators, and policy makers. It is beneficial therefore, to systematically study the

teachers' perception of content knowledge and the pedagogical knowledge in the use of teaching and learning materials in teaching in inclusive classrooms.

3. PURPOSE OF THE STUDY

The purpose of this study is to investigate teachers' perceived use of teaching and learning materials in the teaching of mathematics, social studies, science and literacy skills in inclusive basic schools using the TPACK model.

4. RESEARCH QUESTION

1 What is the perception of teachers' use of teaching and learning materials within the context of TPACK variables?

5. HYPOTHESES

1 There is no significant correlation between teachers' perceived usage of TLMs in teaching mathematics, social studies, science, literacy skills, and the variables of TPACK.

2 There is no significant difference in perception between male and female teachers in the use of TLMs in teaching mathematics, social studies, science, and literacy skills.

3 There is no significant difference in perception between special education teachers and general education teachers in the use of TLMs in mathematics, social studies, and science and literacy skills.

6. METHODOLOGY

6.1. Participants

This study involves collection of survey data from teachers in fifteen inclusive schools in the Central, Greater Accra and Eastern Regions of Ghana. From a population of 35 inclusive pilot schools in Ghana, 15 were chosen for the study through a process that involved both convenience and purposive sampling. These schools were chosen on the basis of proximity, and accessibility. Ten teachers from each school were randomly selected to participate in the study. In all, 145 participants made of 64 males and 81 females who correctly completed the questionnaires were involved in the study. Again, 47 participants were special education teachers while 98 were general education teachers.

6.2. Instrument

A modified version of (TPACK) instrument developed by Schmidt *et al.* (2009) was used for data collection. The instrument consists of 47 items with Cronbach's reliability coefficient; ranged from .75 - .92 for the seven TPACK subscales. The items include seven subscales that measured the teachers' TK, CK, PK, PCK, TCK, TPK, and TPACK. The scales were designed on a five point Likert scale format ranging from Strongly Disagree (SD), Disagree (D), Uncertain (U) Agree (A), and Strongly Agree (SA). High scores on the scale indicated that the participant exhibited high level of perception about the use of teaching and learning materials.

3.6. Procedure for Data Collection

Permission to conduct the study was obtained from the Directors of Education from the various Districts, Municipal, and Metropolitan Education Directorate of Education. Participation in the study was voluntary and the participants were made to understand that they were free to discontinue with the study whenever they felt so. The participants were assured that their responses could not be traced to them. To ensure confidentiality, the participants were provided with envelopes to return the completed questionnaire. Out of the 150 questionnaires distributed, 145 envelopes contained questionnaires that were duly completed and found usable were returned representing 96.6%.

6.4. Data Analysis

Each item response was scored with a value of 1 assigned to strongly disagree, all the way to 5 for strongly agree. For each construct the participants' responses were averaged to produce scores, which were transformed into percentages, means and standard deviations. Descriptive statistics were completed for individual survey items, as categorized in the seven TPACK domains. The Pearson correlation was used to determine the correlation coefficient between the TPACK variables. The independent t-test was used to find the mean differences between male and female teachers' perceptions on the use of teaching and learning materials in teaching mathematics, social studies, science, and literacy skills as well as the mean differences between the special educators and the general educators.

7. RESULTS

Table- 1. Responses on Teachers' Perceived Technology Knowledge (TK)

Statement	SD	D	N	A	SA	M	SD
I know how to solve my own technical problems	15 (10.3)	41 (28.3)	26 (17.9)	45 (31.0)	18 (12.4)	3.07	1.244
I can learn technology easily	13 (9.0)	38 (26.2)	29 (20.0)	41 (28.3)	24 (16.6)	3.17	1.244
I keep up with important new technologies	12 (8.3)	35 (24.1)	27 (18.6)	47 (32.4)	24 (16.6)	3.25	1.228
I frequently play around with the technology	9 (6.2)	37 (25.5)	26 (17.9)	49 (33.8)	24 (16.6)	3.29	1.196
I know about a lot of different teaching and learning materials	12 (8.3)	34 (23.4)	25 (17.2)	48 (33.1)	26 (17.9)	3.29	1.241
I have the technical skills I need to use teaching and learning materials in the classroom	8 (5.5)	33 (22.8)	31 (21.4)	45 (31.0)	28 (19.3)	3.36	1.188
I have had sufficient opportunities to work with different teaching and learning materials	10 (6.9)	30 (20.7)	29 (20.0)	46 (31.7)	30 (20.7)	3.39	1.220

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

For the purpose of answering research question 1, respondents were asked to respond to the various scales under the TPACK model. As can be seen in Table 1, the results of the descriptive analysis, (means, standard deviations and percentages were presented. The results suggest that teachers' technological knowledge is

moderate to high. The mean scores ranged from 3.07 -3.39. This indicates that majority of the teachers agreed/strongly agreed to have technological knowledge.

Table- 2. Responses on Teachers' Perceived Content Knowledge (CK)

Statement	SD	D	N	A	SA	M	SD
Mathematics							
I have sufficient knowledge about mathematics	7 (4.8)	20 (13.8)	23 (15.9)	61 (42.1)	34 (23.4)	3.66	1.127
I can use a mathematical way of thinking	3 (2.1)	19 (13.1)	24 (16.6)	61 (42.1)	38 (26.2)	3.37	1.046
I have various ways and strategies of developing my understanding of mathematics	2 (1.4)	20 (13.8)	19 (13.1)	59 (40.7)	45 (31.0)	3.86	1.052
Social Studies							
I have sufficient knowledge about social studies	4 (2.8)	19 (13.1)	14 (9.7)	65 (44.8)	43 (29.7)	3.86	1.074
I can use a historical way of thinking	2 (1.4)	21 (14.5)	13 (9.0)	70 (48.3)	39 (26.9)	3.85	1.023
I have various ways and strategies of developing my understanding of social studies	0 (0.0)	16 (11.0)	20 (13.8)	63 (43.4)	46 (31.7)	3.96	.949
Science							
I have sufficient knowledge about science	1 (.7)	10 (6.9)	25 (17.2)	61 (42.1)	48 (33.1)	4.00	.920
I can use a scientific way of thinking	2 (1.4)	12 (8.3)	21 (14.5)	64 (44.1)	46 (31.7)	3.97	.960
I have various ways and strategies of developing my understanding of science	2 (1.4)	16 (11.0)	16 (11.0)	73 (50.3)	38 (26.2)	3.89	.965
Literacy							
I have sufficient knowledge about literacy	2 (1.4)	12 (8.3)	22 (15.2)	69 (47.6)	40 (27.6)	3.92	.939
I can use a literacy way of thinking	2 (1.4)	7 (4.8)	21 (14.5)	73 (50.3)	42 (29.0)	4.01	.870
I have various ways and strategies of developing my understanding of literacy	2 (1.4)	12 (8.3)	16 (11.0)	74 (51.0)	41 (28.3)	3.97	.924

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

Table 2 shows the responses of the teachers on the content knowledge. The results indicated that teachers perceived themselves as having the content knowledge in mathematics, social studies, science, and literacy skills. A look at Table 2 revealed that majority of the teachers agreed/strongly agreed to the items in the content knowledge. The mean scores (3.66, 3.37, 3.86), indicated a high knowledge in mathematics. The mean scores for social studies (3.86, 3.85, and 3.96) showed a high perceptual knowledge, while the mean scores for the items in science (4.00, 3.97, and 3.89) implies that teachers' perceived knowledge in science content is high. Finally, the teachers also showed high perceptual knowledge in literacy skills with the means of (3.92, 4.01, and 3.97).

Table- 3. Responses on Teachers' Perceived Pedagogical Knowledge (PK)

Statement	SD	D	N	A	SA	M	SD
I know how to assess student performance in a classroom	5 (3.4)	12 (8.3)	17 (11.7)	64 (44.1)	47 (32.4)	3.94	1.042
I can adapt my teaching based upon what students currently understand or do not understand	4 (2.8)	13 (9.0)	15 (10.3)	66 (45.5)	47 (32.4)	3.96	1.020
I can adapt my teaching style to different learners	5 (3.4)	12 (8.3)	21 (14.5)	62 (42.8)	45 (31.0)	3.90	1.046
I can assess student learning in multiple ways	7 (4.8)	12 (8.3)	19 (13.1)	67 (46.2)	40 (27.6)	3.83	1.074
I can use a wide range of teaching approaches in a classroom setting	6 (4.1)	16 (11.0)	17 (11.7)	63 (43.4)	43 (29.7)	3.83	1.099
I am familiar with common student understandings and misconceptions	8 (5.5)	13 (9.0)	21 (14.5)	62 (42.8)	41 (28.3)	3.79	1.117
I know how to organize and maintain classroom management	6 (4.1)	17 (11.7)	15 (10.3)	71 (49.0)	36 (24.8)	3.79	1.075

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

Results on perceived teachers' pedagogical knowledge for the seven items are presented in Table 3. The teachers responded that they had a high level of pedagogical knowledge. The mean scores of (3.94, 3.96, 3.90, 3.83, 3.83, 3.79, and 3.79) confirmed this. Almost all the teachers agreed/strongly agreed that they could use a wide range of teaching approaches in classroom.

Table- 4. Responses on Teachers' Perceived Pedagogical Content Knowledge (PCK)

Statement	SD	D	N	A	SA	M	SD
I can select effective teaching approaches to guide student thinking and learning in mathematics	5 (3.4)	16 (11.0)	21 (14.5)	64 (44.1)	39 (26.9)	3.80	1.065
I can select effective teaching approaches to guide student thinking and learning in literacy	6 (4.1)	15 (10.3)	16 (11.0)	71 (49.0)	37 (25.5)	3.81	1.061
I can select effective teaching approaches to guide student thinking and learning in science	6 (4.1)	15 (10.3)	13 (9.0)	74 (51.0)	37 (25.5)	3.83	1.054
I can select effective teaching approaches to guide student thinking and learning in social studies	8 (5.5)	13 (9.0)	14 (9.7)	72 (49.7)	38 (26.2)	3.82	1.091

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

Teachers' responses on pedagogical content knowledge are presented in Table 4. The results showed that teachers had high levels of pedagogical content knowledge in mathematics, social studies, science, and literacy skills. Majority of the teachers agreed/ strongly agreed that they had pedagogical content knowledge with the mean scores of 3.80, 3.81, 3.83, and 3.82.

Table- 5. Responses on Teachers' Perceived Technology Content Knowledge (TCK)

Statement	SD	D	N	A	SA	M	SD
I know about teaching and learning materials that I can use for understanding and doing mathematics	9 (6.2)	16 (11.0)	28 (19.3)	65 (44.8)	27 (18.6)	3.59	1.103

I know about teaching and learning materials that I can use for understanding and doing literacy	6 (4.1)	27 (18.6)	26 (17.9)	57 (39.3)	29 (20.0)	3.52	1.131
I know about teaching and learning materials that I can use for understanding and doing science	7 (4.8)	35 (24.1)	24 (16.6)	55 (37.6)	24 (16.6)	3.37	1.160
I know about teaching and learning materials that I can use for understanding and doing social studies	5 (3.4)	34 (23.4)	25 (17.2)	57 (39.3)	24 (16.6)	3.42	1.122

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

In Table 5, the results of teachers' responses on technological content knowledge (TCK) are presented. The results indicated that majority of the teachers agreed/strongly agreed that they had technological content knowledge. The mean scores, 3.59, 3.52, 3.37, and 3.42 as shown in Table 5 revealed that the teachers perceived themselves as having a high technological content knowledge.

Table- 6. Responses on Teachers' Perceived Technological Pedagogical Knowledge (TPK)

Statement	**SD**	**D**	**N**	**A**	**SA**	**M**	**SD**
I can choose teaching and learning materials that enhance the teaching approaches for a lesson	7 (4.8)	35 (24.1)	23 (15.9)	56 (38.6)	24 (16.6)	3.38	1.161
I can choose teaching and learning materials that enhance students' learning for a lesson	11 (7.6)	33 (22.8)	27 (18.6)	49 (33.8)	25 (17.2)	3.30	1.215
My teacher education program has caused me to think more deeply about how teaching and learning materials could influence the teaching approaches I use in my classroom	10 (6.9)	37 (25.5)	22 (15.2)	52 (35.9)	24 (16.6)	3.30	1.214
I am thinking critically about how to use teaching and learning materials that I am learning about to different teaching activities	13 (9.0)	36 (24.8)	22 (15.2)	47 (32.4)	27 (18.6)	3.27	1.271
I can adapt the use of the teaching and learning materials that I am learning about to different teaching activities.	14 (9.7)	32 (22.1)	23 (15.9)	46 (31.7)	30 (20.7)	3.32	1.289

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

Table 6 shows the teachers' responses on technological pedagogical knowledge. The mean results (3.38, 3.30, 3.30, 3.27, and 3.32) indicated a moderate level. More than two- thirds agreed/strongly agreed to the items in favour of technological pedagogical content knowledge.

Table- 7. Responses on Teachers' Perceived Technological Pedagogical Content Knowledge (TPACK)

Statement	**SD**	**D**	**N**	**A**	**SA**	**M**	**SD**
I can teach lessons that appropriately combine mathematics, teaching and	17 (11.7)	32 (22.1)	24 (16.6)	47 (32.4)	25 (17.2)	3.21	1.292

learning materials, and teaching approaches.							
I can teach lessons that appropriately combine literacy, teaching and learning materials and teaching approaches.	13 (9.0)	35 (24.1)	23 (15.9)	47 (32.4)	26 (17.9)	3.32	1.431
I can teach lessons that appropriately combine science teaching and learning materials, and teaching approaches.	11 (7.6)	36 (24.8)	24 (16.6)	52 (35.9)	22 (15.2)	3.26	1.208
I can teach lessons that appropriately combine social studies, teaching and learning materials, and teaching approaches.	7 (4.8)	46 (31.7)	16 (11.0)	51 (35.2)	25 (17.2)	3.28	1.217
I can select teaching and learning materials to use in my classroom that enhance what I teach, how I teach, and what students learn.	11 (7.6)	38 (26.2)	22 (15.2)	49 (33.8)	25 (17.2)	3.27	1.237
I can use strategies that combine content, teaching and learning materials, and teaching approaches that I learned about in my course work in my classroom	8 (5.5)	40 (27.6)	22 (15.2)	48 (33.1)	27 (18.6)	3.32	1.217
I can provide leadership in helping others to coordinate the use of content, teaching and learning materials, and teaching approaches at my school and/or district.	12 (8.3)	35 (24.1)	25 (17.2)	47 (32.4)	26 (17.9)	3.28	1.244
I can choose teaching and learning materials that enhance the content for a lesson.	7 (4.8)	41 (28.3)	24 (16.6)	44 (30.3)	29 (20.0)	3.32	1.218

Mean 1-2.4 low; 2.5 – 3.4 moderate; 3.5-5 high (figures in parenthesis are in percentages)

Responses on teachers' perceived technological pedagogical content knowledge (TPACK) have been presented in Table 7. The mean results (3.21, 3.32, 3.26, 3.28, 3.27, 3.32, 3.28, and 3.32) indicated teachers' perception of TPACK was moderate.

Table- 8. Correlations

MATH SST	SCI	LIT	TK	PK	PCK	TCK	TPK	TPACK	
MATH	1								
SST	712*	1							
SCI	490	752*	1						
LIT	555*	648*	789*	1					
TK	660*	494*	409*	414*	1				
PK	576*	569*	612*	772*	383	1			
PCK	543*	544*	536*	586*	323	741*	1		
TCK	547*	512*	401*	322	648*	332	550*	1	
TPK	562*	506*	421*	367	752*	314	363	768*	1
TPACK 579*	462*	441*	417*	780*	427*	418*	700*	867*	1

Mean	11.28	11.66	11.85	11.89	22.81	27.04	15.27	13.90	19.57
26.26									
St. Deviation	3.013	2.87	2.70	2.54	7.97	6.78	4.04	4.17	5.82
9.32									

*correlation significant at the 0.05 level (2 tail)

To test hypothesis 1, a correlation coefficient between content areas of mathematics, social studies, science, and literacy skills with the TPACK variables are shown in Table 8. The results showed significantly high positive correlations between the teachers' perceived use of TLMs in teaching mathematics, social studies, science, and literacy skills and the TPACK variables. Again, a look at Table 8 shows that the results revealed that the TPACK variables were highly positively correlated with each other. Based on the results the null hypothesis cannot be retained.

Table- 9. Differences between male and female teachers use of TLMs

	Gender	Mean	St. D	df	t	sig
Math	Male	12.17	2.542	143	3.235	.002
	Female	10.59	3.185			
Soc. Studies	Male	12.44	2.301	143	2.966	.004
	Female	11.05	3.134			
Science	Male	12.30	2.341	143	1.764	.080
	Female	11.51	2.920			
Literacy	Male	12.34	2.489	143	1.926	.056
	Female	11.53	2.549			

Sig = 0.05

In Table 9, the mean scores, the standard deviations, and the t values have been shown. The results indicated that there is a significant difference between male and female teachers' use of TLMs in mathematics [t (143) = 3.235, p = .002] and Social Studies. [t (143) = 2. 926, p = 004]. The male teachers had higher scores in mathematics (M = 12.17, SD = 2.542) than did the females (M = 10.59, SD= 3.185) and in social studies the males had (M = 12.44; SD = 2.301) while the females had (M = 11.05; SD = 3.134), In the case of science and literacy skills, no significant differences were noted between the males and the females. The results also indicated that the males had higher mean scores in science (M = 12.30, SD = 2.341) than the females (M = 11.51, SD= 2.920), however, the difference was not statistically significant [t (143) = 1.764, p = 0.08]. The result of literacy skills showed that the males had M = 12.34, SD = 2.489 and the females had (M = 11.53, SD = 2.549), which indicated no difference between the genders [t (143) = 1.926, p = .056]. The implication is that, while the hypothesis is rejected for the teaching of math and social studies, the hypothesis however was accepted in support of science and literacy skills.

Table-10. Differences between special and general educators in the use of TLMs

		Mean	Std	df	t	sig
Math	Special	11.53	3.222	143	.669	.505
	General	11.17	2.918			
SST	Special	11.26	3.332	143	-1.182	.239
	General	11.80	2.599			
Science	Special	11.96	2.926	143	.315	.753
	General	11.80	2.599			
Literacy	Special	12.81	2.557	143	.430	.668
	General	11.83	2.552			

Sig = 0.05

Hypothesis 3 sought to establish the significant difference in the use of teaching and learning materials between special educators and the general educators. To test this hypothesis, the mean scores and the standard deviations of the two groups were compared. The results are shown in Table 10. The results obtained for mathematics, [t (143) = .669, p = .505], social studies, [t (143) = -1.182, p = .239], science, [t (143) = .315, p = .753], and literacy skills [t (143) = .430, p = .668] did not show any statistically significant differences between the special educators and the general educators. The hypothesis was therefore, accepted. This implies that both the special educators and the general educators used teaching and learning materials at the same level.

8. DISCUSSION

Research question 1 was aimed at investigating the levels of perceived use of teaching and learning materials. The result of the study showed that the respondents were unanimous in their perceived use of teaching and learning materials as depicted by the TPACK variables. The mean scores for the items in the subscales showed that teachers' perceived use of teaching and learning materials ranged from moderate to high. Studies suggest that these dimensions, and the values embedded in these variables are key characteristics of effective teaching and learning in an age of technology (Koehler and Mishra, 2009). It has become critical that teachers teaching in inclusive classrooms, where there is diversity of children's needs including those with disabilities, gain the competency in content knowledge, pedagogical knowledge and technological knowledge for effective classroom teaching. Teachers need assistance in becoming more aware of how educational technologies can be used to help their students meet a range of instructional objectives. These considerations can be supported by taking into account of Koehler and Mishra (2008)TPACK theoretical framework to strengthen possible links and interactions between all main factors of pedagogy, technology and content knowledge. Although, the findings suggest that teachers exhibited medium to high knowledge in all the TPACK domains, there is the need for a further study to investigate the level of knowledge teachers might have. This is because; there is little evidence of these practices in the curriculum and training of pre-service teacher education institutions in Ghana.

Overall, the findings demonstrated significant correlation between the TPACK variables. This result confirms the findings of Schmidt *et al.* (2009) who found high positive correlation between the TPACK components. In addition, the results provided further evidence that teachers' basic

knowledge about TPACK were related positively and therefore shows support for the theoretical model as postulated by Mishra and Koehler (2006).

While the result of the second hypothesis demonstrated significant differences in the perception of male and female teachers in mathematics and social studies, no significant difference was found in science and literacy skills. The explanation for this finding is quite illusive. Nevertheless, it could be attributed to the teachers' interest and flair in teaching a particular subject area(s).

The results of hypothesis three revealed that there were no significant differences between special educators and general educators. This finding contradicts what Luseno (2001) found in his study that the general educators consistently had lower mean ratings, than special educators, on all the statements categorized under this factor. This indicates that general educators did not perceive usage of resources in teaching as the special educators did.

9. CONCLUSION

The findings of this study may be specific to the teachers in the inclusive schools but their implications are significant to other educators as well. With regard to the perceived use of teaching and learning materials, on an average, more than two-thirds of the teachers agreed/ strongly agreed that they had used them. The findings revealed that teachers' perception of the use of teaching and learning materials within the TPACK model showed medium to high competency. This reinforces the need to train teachers in the use of teaching and learning materials that would include both electronic (ICT) and non-electronic; and train teachers to gain the connection between competency in subject matter knowledge, and pedagogical content knowledge connection.

10. LIMITATION

The study presented here includes some limitations. First, the results are based on teacher self-reports. Doing so was appropriate in this case; the researcher was interested in teachers' perception of a process that was being required of them. However, self-reported data do not provide a full picture of the knowledge and use of teaching and learning materials. Another, possible limitation of the study relates to the finding that a large proportion of teachers rated their knowledge in the TPACK components as high thus causing concern as the validity of their reported perception. Teachers with greater knowledge of the content and pedagogical skills may therefore, have, arguably provided more valid perception, less affected by bias, than those with poorer knowledge of content and pedagogy. Finally, the study used a questionnaire method, in spite of this, a further research in this direction using both interviews and systematic observation to explore, if teachers actually used the teaching and learning materials in the inclusive classrooms.

11. RECOMMENDATIONS

Teacher education institutions should provide additional planning time for pre-service teachers to experiment with variety of teaching and learning materials in teaching mathematics, social studies, science and literacy skills. This implies that integrating technology education initiative should include measures for preparing teachers to use them fully in variety of ways in their teaching practice. Such conclusion points to invariable the supply of educational technology

resources to the schools by the authorities. There is the need to create awareness on the usefulness and importance in the use of teaching and learning materials in classroom practice. It is therefore necessary to create a seminal, workshops or training service teachers to facilitate the use of the TLMs. Besides, technology centres in teaching and learning could be established in higher education institutions.

REFERENCES

Chen, C.H., 2008. Why do teachers not practice what they believe regarding technology integration? Journal of Educational Research, 102(11): 65-75.

Cox, S., 2008. Aconceptual analysis of technological pedagogical content knowledge. Unpublished doctorial dissertation, Brgham Young University, Provo, UT.

Hernández-Ramos, P., 2005. If not here, where? Understanding teachers' use of technology in silicon valley schools. Journal of Research on Technology in Education, 38(1), 39-65.

Hite, A.S., 2005. Are we there yet? A study of K-12 teachers' efforts at technology integration.Ph.D. dissertation, The University of Pennsylvania, United States– Pennsylvania. Retrieved, April 2, 2012, from dissertation and thesis: Full text. (Publication No.AAI3168028).

Koehler, M. and P. Mishra, 2009. What is technological pedagogical content knowledge? Contemporary Issues in Technology and Teacher Education, 9(1): 60–70.

Koehler, M.J. and P. Mishra, 2008. Introducing technological pedagogical knowledge. In the handbook of technological pedagogical content knowledge for educators, edited by AACTE committee on innovation and technology. AACTE and Routledge, NY.

Koehler, M.J., P. Mishra and K. Yahya, 2007. Tracing the development of teacher knowledge in design seminar: Integrating content, pedagogy and technology. Computers and Education, 49(3): 740-762.

Littrell, A.B., M.G. Zagumny and L.L. Zagumny, 2005. Contextual and psychological predictors of instructional technology use in rural classrooms. Educational Research Quarterly, 29(2):37-47.

Luseno, F.K., 2001. Assessment of the perception of secondary special and general education teachers working in inclusive settings in the Commonwealth of Virginia. Unpublished PhD dissertation, Virginia Polytechnic Institute and State University. pp: 29.

Mishra, P. and M. Koehler, 2006. Technological pedagogical content knowledge: A framework for teacher knowledge. Teachers College Record, 108(6): 1017–1054.

Neiderhauser, D.S. and T. Stoddart, 2001. Teachers, instructional perspectives and use of educational software. Teaching and Teacher Education, 17(1): 15-31.

O'Bannon, B. and S. Judge, 2004. Implementing partnerships across the curriculum with technology. Journal of Research on Technology in Education, 37(2):197-213.

Pan, A.C. and S.Z. Carroll, 2008. Preservice teachers explore instructional software with children. The Educational Forum, 66(4): 371-379.

Schmidt, D., E. Baran, A. Thompson, P. Mishra, M. Koehler and T. Shin, 2009. Technological pedagogical content knowledge (TPACK): The development and validation for pre-service teachers. Journal of Technology in Education, 42(2): 123149.

Shulman, L., 1986. Those who understand: Knowledge growth in teaching. Educational Researcher, 15(2): 4–14.

Wallace, R.M., 2001. Teaching with the internet: A conceptual framework for understanding the teacher's work and an empirical study of the work of three high school science teachers. Dissertation Abstracts International, 61(10): 38-84.