

# INFORMATION COMMUNICATION TECHNOLOGY COMPETENCE AND TECHNOLOGICAL PEDAGOGICAL CONTENT KNOWLEDGE OF SENIOR HIGH SCHOOL SOCIAL STUDIES TEACHERS: A FOOTPATH TO 21<sup>ST</sup> CENTURY CLASSROOM INSTRUCTIONAL PRACTICES IN THE BONO REGION OF GHANA

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## ABSTRACT

In spite of the undeniable reality of technology explicitly or implicitly influencing classroom instruction in the 21<sup>st</sup> century, evidence from developing economies have shown that relatively few teachers fully integrate technology in their instructional delivery, thereby bringing into inquiry their Information Communication Technology (ICT) and Technological Pedagogical Content Knowledge (TPACK) competencies. Accordingly, this study employed Shuman 1986 Theory on Pedagogical Content Knowledge to investigate Senior High School Social Studies teachers' competence in the use of ICT as well as their knowledge on TPACK. Additionally, the study investigated the effect of TPACK on Social Studies teachers classroom instructional practices. In line with positivist paradigm, this study utilized cross-sectional descriptive survey design with quantitative approach where through census sampling, 303 Social Studies teachers were sampled to participate in the study with the main instrument being structured questionnaire whose reliability was assessed using Cronbach alpha. Descriptive statistics (mean and standard deviation) and inferential statistics (multiple and stepwise regression) were used to analyse the research questions and hypothesis outlined in the study. The findings of the study revealed that Senior High School Social Studies teachers had high competence in the use of ICT and TPACK. It was again established that teacher competence on TPACK significantly predicted their classroom instructional practices and that competence in the use of ICT strengthened the effect of TPACK on the classroom instructional practices. Therefore, it was recommended that the strategies aimed at improvement in use of ICT should run concurrently with approaches to enhancing knowledge in TPACK of the teachers for more improved classroom instructional practices. The study, therefore, concluded that teachers use of ICT and knowledge of TPACK is a crucial determinant of their effectiveness and efficiency in classroom instructional practices.

**Keywords:** Social Studies teachers, ICT, TPACK, classroom instructional practices, Senior High School

## INTRODUCTION

Lately, the unprecedented advances in technology coupled with the rapidly changing nature of Information and Communication Technologies (ICTs) is rooted in the conviction that integration of technology in education is crucial and a major strategy for ensuring quality education. Indeed, scholars like Lachner et al., (2021) have adduced evidence in support of the unprecedented scramble for technology integration in teaching when they observed that classroom instruction is now characterised by an acceleration of instructional technologies designed to increase efficiency, expand productivity, and eventually improve students' total learning experiences. Further in this regard, the surge in technology in the 21<sup>st</sup> century has

extraordinarily transformed classroom instruction which has given rise to various content and pedagogical methodologies swayed by technology where learners depend on as a source of getting information and staying connected (Fraillon et al., 2020). Consequently, for effective instructional delivery, teachers are not only required to be dependent on their content and pedagogical prowess but also have adequate awareness, understanding and skills essential to design and teach pedagogically sound, technologically incorporated, standards-based instructions (Ifinedo et al., 2019). Hence, tacit construct like teacher ICT competence as well as the Technological Pedagogical Content Knowledge (TPACK) of teachers have come under spotlight especially against the backdrop of digitalized age.

The demand for teachers to have higher competencies in TPACK and integrate ICT in their instructional delivery has heightened recently due to the adoption of international conventions that seek to expand the ICT competencies of learners in this knowledge world (Kadioğlu-Akbulut et al., 2023; UNESCO, 2021). For instance, Ghana has shown commitment to the achievement of Sustainable Development Goal 4.4 which aims to provide quality education to its citizenry by equipping learners to become digitally literate and increase their capacity to employ digital devices and networked technologies to securely and efficiently access, manage, grasp, integrate, communicate, analyze, and generate information for participation in economic and social life (UNESCO, 2021). In pursuant to the realization of the SDG goal 4 in enhancing the digital literacy of students, the National Council for Curriculum and Assessment (NaCCA 2019) reiterate that the 2019 curriculum reform in Ghana is in response to a national priority of moving the structure and content of the education system away from simply passing examinations and toward creating character, nurturing values, and raising literate, confident, and involved citizens capable of critical thinking and digital literacy. This point is substantiated especially within the context of Social Studies which aims to generate reflective, concerned, digitally literate and competent citizens capable of making educated decisions for the benefit of both individuals and society (NaCCA 2019). As a result, designing effective and efficient learning environments by incorporating contemporary educational technologies into the teaching process has become an essential goal in education more than ever before.

Social Studies as a subject aims at preparing the youth in school to become good citizens who can make positive impact in the development of their communities and Ghana as a whole. In a study to examine the effectiveness of the Social Studies curriculum, Eshun (2020) recommended that since Social Studies is seen as a positive attitude building subject through time and space, the Ghanaian school curriculum should be enhanced to reflect the current happenings in society to help develop 21<sup>st</sup> century youth who would be well resourced to selflessly help keep the country on a sound developmental path. Implicit in the view of Eshun (2020) is the inference that the Social Studies curriculum, if well-structured and implemented could raise individuals who are selfless and possess the requisite knowledge and skills for promoting positive development of society. This calls for high competence in ICT as well as TPACK prowess among Social Studies teachers to be able to connect the teaching of Social Studies content and skills with technology which has been found to improve the academic achievement of students in social studies which is an important determinant of democratic development of Ghana, loyalty of citizens and civic responsibility. Scott (2015) noted that information technology through technology integration in education has the potential to reshape learning experiences towards new skills such as computational thinking, problem solving, innovative product creation, collaborators and effective communicators otherwise referred to as 21<sup>st</sup> century skills. This claim therefore supports the clarion call for teachers to be competent in ICT as so as to combine technological knowledge, pedagogical knowledge

and content knowledge during their instructional delivery. Consequently, research on improving Social Studies teachers competencies to integrate ICT in Social Studies instruction for the attainment of objectives for Social Studies as a subject in the Senior High School level has gained reasonable attention among Social Studies educators.

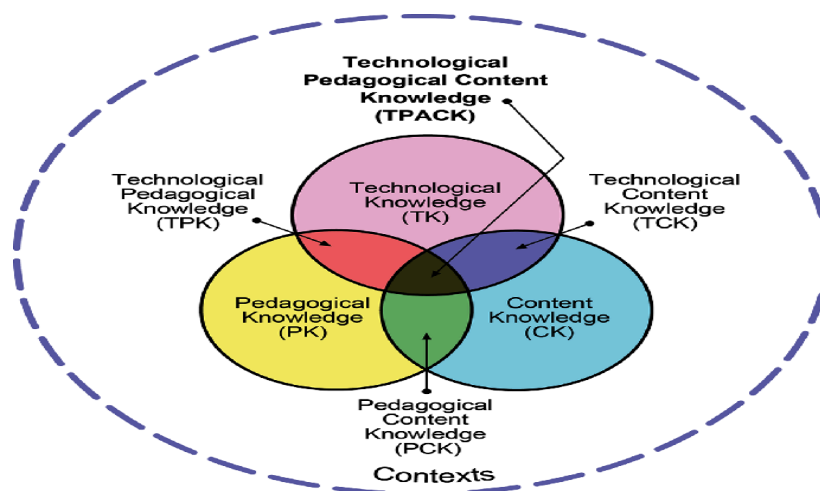
From the preceding discussions, it could be realized that teacher effectiveness in instructional delivery is not only contingent on content and pedagogical knowledge and prowess but the classroom environment is now seen as an arena where teachers' competencies are also tested in their knowledge of ICT and TPACK for improved learning outcomes. Unlike in the developed countries where as technology advances, teachers are fervent and zealous to consistently explore and integrate new technological oriented ways of pedagogy, teachers in developing countries are not only frightened but are also apprehensive by the advent of technology and as a result put up a very unwelcoming attitude towards the adaptation of technology integration as they deem it irrelevant for their use in teaching because of its changing and opaque nature relative other traditional pedagogical approaches which brings into question the TPACK competencies and preparedness (Chukwuemeka et al., 2019; Shafie et al., 2021). Nevertheless, educationist and academicians accentuate that for effective instructional delivery, there ought to be integration of technology into classroom instruction (Andyani et al., 2020; Ifinedo et al., 2019). Prinz et al. (2020) concur that, effective and efficient integration of technology cannot be achieved until the teachers begin to change their mindsets positively towards the use of technology in their daily educational activities by going beyond the knowledge of the technology equipment provided through pedagogical theories and teacher education programmes. Understandably, teachers' ICT and TPACK competence has become a catchphrase among educational stakeholders, and would continue to be for the next decades.

In educational institutions, teachers' integration of ICT tools in their instructional delivery is hugely contingent on their ICT competence and self-efficacy (Akyildiz & Kaya, 2023; Gbemu et al., 2020). ICT competence relates to the teachers' capacity to use ICT and effectively integrate a variety of digital resources into education (Almerich et al., 2016; Aesaert & Van Braak, 2015). Likewise, scholars (Wang & Zhao, 2021; Tondeur et al., 2012) defined ICT competency of teachers as their own ratings of their own skill in utilizing specific software programs (such as Word, Excel, PowerPoint, and Photoshop) and technical talents that may be consistently employed in their instructional delivery. Therefore, because technology is embedded in our lives, teachers are expected to be competent to use these technologies efficiently to create an effective learning environment where innovative approaches are used. Studies (Teo et al., 2019; Pollacia & McCallister, 2019; Englund et al., 2017) have noted that the teaching and learning of Social Studies can be enhanced by using varied ICT pedagogies such as interactive movies, animations, simulations, virtual laboratories, and augmented reality apps, which makes learning more effective, efficient, and interesting. As a result, it could be gleaned from the preceding discussions that there is a demand for skilled teachers who can keep up with contemporary innovations in educational technology and integrate them into their subject area.

To this end, educational researchers have identified TPACK postulated by Shulman (1986) and further expounded by Mishra and Koehler (2006) to be the framework in promoting TPACK prowess of teachers for successful technology integration in instruction which has been proven to be the difference in both theory and practice (Canbazoglu et al., 2013; Abbitt, 2011). "TPACK is the basis of effective teaching with technology, requiring an understanding of the representation of concepts using technologies; pedagogical techniques

that use technologies in constructive ways to teach content; knowledge of what makes concepts difficult or easy to learn and how technology can help redress some of the problems that students face; knowledge of students' prior knowledge and theories of epistemology; and knowledge of how technologies can be used to build on existing knowledge to develop new epistemologies or strengthen old ones" (Koehler & Mishra, 2009, p.66).

Koehler and Mishra (2009) proffered a theoretical model of teachers' technological pedagogical content knowledge and identify seven components namely: Content Knowledge (CK), Pedagogical Knowledge (PK), Technological Knowledge (TK), Pedagogical Content Knowledge (PCK), Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK) and Technological Pedagogical Content Knowledge (TPACK). In arguing for their model, Koehler and Mishra (2009) contended that teachers must be competent in these three types of knowledge, and more importantly, they must be able to integrate all three forms of knowledge in their practice. A reciprocal relationship of TPACK is depicted below:



- Content Knowledge (CK): refers to a teacher's knowledge of content area/subject knowledge/subject matter that he/she teacher such as Social Studies, English, Mathematics, etc.
- Pedagogical Knowledge (PK): refers to a teacher's Knowledge on the various methods, techniques and strategies to deliver content. It also relates to how a teacher plan to teach, how to teach, how to manage students, how to behave in addressing the individual differences as a result of the heterogeneous classroom.
- Pedagogical Content Knowledge (PCK): relates to a teacher's knowledge on the intersection of pedagogical knowledge and content knowledge. The thrust here is a teacher's core business of teaching, learning, curriculum, assessment and reporting. It also deals with the awareness of students' prior knowledge, alternative teaching strategies, common content-related misconceptions, and how to forge links and connections among different content-based ideas.
- Technological Knowledge (TK): refers to a teacher's knowledge on the contemporary and standard technologies required to teach. These include books, chalks, black and marker boards as well as internet and digital videoing. TK also include teacher's knowledge on operating systems and standard sets of software tools such as word processors, spreadsheets, browsers and e-mail. Mishra and Koehler also added knowledge of how to install and remove peripheral devices, install and remove software programmes, and

create and archive documents. It is however, important to note that TK also talks about teacher's ability to adjust to new and emerging technologies overtime

- Technological Content Knowledge (TCK): refers to a teacher's knowledge on how content can be investigated or taught with the help of technology. For example; giving information about earthquakes with the help of internet and the use of technological devices to study. TCK discusses the need for teachers to know not only the subject matter they teach but also the manner in which the subject matter can be enhanced/represented by the application of technology.
- Technological Pedagogical Knowledge (TPK): talks about a teacher's knowledge on how technology can facilitate the pedagogical skills and techniques employed in teaching. It refers to a teacher's ability to engage students in activities by using emerging technologies. In sum, it is teachers' knowledge of the numerous technologies that can be assembled in teaching and learning.
- Technological Pedagogical Content Knowledge (TPACK): refers to teachers knowledge and appreciation of the power and the benefits of the unionism behind blending content, pedagogy and technology to make student learning easier on a specific content with the appropriate pedagogy and technology. For instance, TPACK comprises the knowledge of instructional strategies that allow the effective use of technologies to teach the content of the discipline, and the knowledge of the aspects that make the content easy or difficult to learn, and how technology can help with some of the problems that students face.

In arguing for the success of this framework, Koehler and Mishra (2009) admonishes that teachers ought to be competent in TPACK construct to be effective in integrating technology into classroom instructional practices. Consistent with Koehler and Mishra admonition, scholars have maintained that to successfully integrate technology into instructional delivery, both pre-service and in-service teachers must be competent in information technology and must also have and acquire an understanding of teaching pedagogy and basic content knowledge (Hsieh, 2015; Elwood & Savenye, 2015; Siddiq et al., 2016). In a study on effective integration of technology by Rastogi and Malhotra (2013), it was found that those teachers who were competent in ICT skills proved ICT to be more useful. Indeed, these teachers were more confident, excited and less anxious. Therefore, researchers have inquired into the dimension of ICT that make a teacher competent. Though elusive in dimension, Raob et al. (2012) proposed that teacher competency in ICT can be measured in three main dimensions: basic technology operation, personal use of technology tools and teaching of technology. Competency in basic technology operations entails the ability to open and close computer applications, installing and uninstalling computer software, printer setup selection, having the ability to change desktop settings and keyboard shortcuts. Competency in personal use of technology tools discusses the teacher's capacity to use database such as Microsoft, chatting and e-mail software. Besides, it also talks about the teacher's capability to use and do presentations with applications such as Microsoft word, power point. The teaching of technology component of Raob et al. (2012) model of teacher ICT competency refers to the teacher's ability to navigate through contemporary online portals like facebook youtube, web board and website, use computer assisted programmes in teaching. Therefore, in this study, teachers' ICT Competency were measured in these three constructs.

Besides TPACK, scholars have noticed that teachers' instructional practices are critical to a school's success. Due to the impact of teachers on schools, Yidana (2017) maintained that deploying highly qualified teachers who have solid technological and pedagogical skills has



become a national concern. For schools to be effective, stakeholders in education need to look for opportunities to improve the instructional practices of teachers for the betterment in managing the teaching and learning process, and this can be done through effective development and regular assessment of teachers' instructional practices (Amador et al., 2016). In a review of research on teachers' instructional practices, Hoge (2016) concluded that the classroom practices of teachers have the most influence on student achievement. Other researchers like Waters et al. (2003) discovered that schools that concentrated on the most effective school and classroom practices including instructional strategies could improve their pass rate on a standardized test from 50% to 72%. The preceding views have sustained the truism that teachers are the bedrock of a school, and that their instructional practices determine students' achievement and the success of the school.

Contemporary researchers on teacher effectiveness in instructional delivery like Yidana (2017) calls for a paradigm shift to classroom instructional practices that embody and adopts an integrative approach involving instructional practices and behaviours that are consistent with standard professional requirements all in the same design. In this direction, theorists of teachers' instructional practices such as Yidana (2017) and Lawal (2012) propounded a model termed "professional skills" as a purview of teachers' instructional practices. In this model, four scales of teachers' instructional practices have been identified. These include teachers' skill of instructional planning, skills of instructional delivery and implementation, skills of instructional assessment and generic instructional skills. Instructional planning skills essentially relates to the necessary skills required of the teacher in the election/improvisation of instructional materials that is needed in the realization of instructional objectives. Scholars maintain that the ability of a teacher to select/improvise quality instructional resources is a crucial skill required of a teacher in the instructional planning stage needed to trigger and improve students' learning (Maruff et al., 2011). Teachers display effective instructional planning skills when they are able to sequence topics orderly, systematically and logically. Besides, good instructional planning initiates active participation among students through effective questioning techniques.

Teacher exhibits skills in instructional delivery and implementation as he/she showcases mastery in organizing the content of the lesson that leads to the attainment of instructional objectives. Even though syllabus gives the general picture of the content that is to be taught, teachers with great skills in instructional delivery and implementation would sequence content orderly, systematically and logically. In effective instructional delivery and implementation, there is active participation by students in the lesson and to ensure active participation requires that a teacher should have superior questioning skills (Khan & Inamullah, 2011; Duron et al., 2006) Skills in instructional assessment of a teacher is showcased when there is harmony between a teacher's evaluation questions and instructional objectives, for a misalliance between evaluation questions and instructional objectives leads to poor assessment relative to students learning outcomes (Yidana, 2017). Assessment in any form (portfolios, peer assessment, interview-based assessment, dialogue, journals and scaffold essays) and of any type supporting learning (formative), certifying the achievement or potential of students (summative), and evaluating the quality of educational institutions or programmes (evaluative) should be purposeful and ideally meet the needs of cultural and linguistic diverse students requires the teacher to display skills that makes assessment meaningful (Herrera et al., 2012).

Generic skills of a teacher refer to the sum total of all the skills that a teacher employs in teaching that is non-specific to the instructional planning, delivery and assessment. It

encompasses all those skills and characteristics that make a teacher effective in the teaching and learning process. These attributes entail all but not limited to superior communicative skills, being knowledgeable and having a clear understanding of how children learn, being emotionally intelligent and a role model and being aware of the need to continuously develop professional understanding and practice of teaching and learning. In analysing teachers' instructional practices model, it would be appreciated that it takes a great deal of effort to realise successful classroom delivery. To this end, Oakley (2018) bemoaned that, it should never be said that one does not need any special skills to be a teacher. To be an effective teacher requires one to integrate numerous knowledge and skills to handle the heterogeneous nature of classroom environment (Yidana, 2017).

A corpus of literature theoretically and empirically discovered that self-efficacy in TPACK influences their instructional practices. In their study, Shafie, et al., (2021) averred that teachers ought to have an understanding of how technology can be coordinated with pedagogy and content knowledge in order to assimilate technology effectively into classroom instruction. The main thrust of TPACK relates to how teachers could improve their performance by integrating technology in their instructional processes so as to engender academic achievements (Lin et al., 2013). Hardisky (2018) contended that teachers who are highly efficacious in TPACK are able to profoundly change their pedagogical thinking and can better adjust to the transformative nature of our educational enterprise. Many researchers believe that teachers who are highly efficacious by way of TPACK are potent in integrating technology to improve their effectiveness in instructional delivery by way of the content that is to be taught, the means to teach the content and the technological tool be used as a vehicle in transmitting the content to the learners (Hardisky, 2018; (Cubukcuoglu, 2013; Çoban & İleri, 2013). With these revelations, there is proof that teachers' efficacy in TPACK could predict the effectiveness of teachers in their instructional delivery and positively impact the success of learners in learning.

With the assurance that TPACK enhances instructional practices of the teacher and the overall effectiveness of the school, it should be given the necessary attention it deserves. However, recent research has unveiled that teachers lack adequate opportunities to blend technology in their instructional practices. For instance, Hutchison et al. (2012) observed that teachers often experience challenges to using their TPACK in a systematic and useful way. Evidence from around the world have revealed that teachers encounter multitude of limitations including improper functioning and operation of computers, training, maintenance problems associated with outdated softwares, teachers own self efficacy and time to incorporate technology in their teaching (Hardisky, 2018; Fletcher, 2016; Javeri & Chen, 2006). Understandably, it is necessary to investigate the phenomenon TPACK competencies of teachers and how it impacts on their classroom instructional practices in context specific settings.

Despite the plethora of studies (Agbaglo & Bonsu, 2022; Bordoh et al., 2022; Akpan & Akpan, 2022; Tang et al., 2020) on the nexus between TPACK and classroom instructional practices, empirical evidence emerging from various studies have proven that teachers' have low to moderate knowledge and still struggle to model technology integration to both content and pedagogy (Arhin et al., 2024; Redmond & Peled, 2019; Bakir, 2015). In Ghana, studies have mirrored this claim that for Ghana to realize improved TPACK competencies in other for teachers to effectively incorporate it into teaching and learning, a clear understanding of teachers' TPACK competencies are required and assessment needed from time to time, (Abdulai, 2022; Adarkwah, 2021; Apau, 2017). In furtherance to this call, recent studies in

Ghana (Nyamkye et al., 2021; Gyaase, et al., 2019) noted with great worry about teachers' level of competence, efficacy beliefs, readiness and professional development training for teachers relative to enhancing their knowledge in TPACK constructs. These scenarios suggest that teachers in Ghana exhibit ineffective competencies in TPACK constructs hampering their classroom instructional practices and, therefore, raises the questions such as "what ICT and TPACK competencies teachers' possess and to what extent do teachers' TPACK competencies impact teachers' classroom instructional practices?" The answers to these questions are elusive to the researcher and, therefore, served as the focus of this study.

Moreover, even though several studies have explored the ICT and of TPACK competencies of teachers in Ghana, these studies have concentrated on Ghanaian Language, Basic School teachers, Religious Education, Visual Arts, Social Studies, and Mathematics (Nyamekye et al., 2022; Soh, 2020; Kiyici & Övez, 2021; Asare-Danso, 2017; Adu, 2021; Yalley et al., 2023; Apau, 2017; Akayuure et al., 2013) teachers at different levels of education while studies on these variables from within the context of School Social Studies teachers in Senior High Schools in the Bono Region being sparse. Moreover, these aforementioned studies only looked at ICT and TPACK competencies individually in their respective studies without investigating its effect on teachers' classroom instructional practices. Besides, the Bono Region was carved out from the then Brong Ahafo Region, hence, being a region that has been newly created, it is pertinent to investigate the antecedent of teacher effectiveness such as their ICT and TPACK competence and its effect on classroom instructional practices which I identified as being one of the lacunas in the previous studies reviewed. Hence, in line with these context specific gaps, this study investigated ICT and TPACK competencies and how it influences classroom instructional practices among Senior High School Social Studies teachers in the Bono Region of Ghana.

The following research questions guided the study:

1. What is the level of ICT competency among Social Studies teachers in Senior High Schools in the Bono Region?
2. What is the level of technological pedagogical content knowledge (TPACK) among Social Studies teachers in Senior High Schools in the Bono Region?
3. What is the effect of technological pedagogical content knowledge on Social Studies teachers' classroom instructional practices in Senior High schools in the Bono Region?

The study also tested the following hypothesis

H<sub>01</sub>: Social Studies teachers' competency in ICT will not significantly strengthen the effect of technological pedagogical content knowledge on teachers' classroom instructional practices.

H<sub>A1</sub>: Social Studies teachers' competency in ICT will significantly strengthen the effect of technological pedagogical content knowledge on teachers' classroom instructional practices.

The study hoped to make significant contributions to the effective teaching and learning of Social Studies within the Senior High Schools in the Bono Region of Ghana. It is anticipated that the results of the study would inform the Social Studies teachers about their level of competence in ICT and TPACK, and the degree to which their level of competence in ICT and TPACK, influence their instructional practices. This awareness would make Social Studies teachers hone and intensify their level of competency to boost their instructional practices and lead to desirable learning outcomes among students. Besides, the results of the



study would be beneficial to Social Studies teachers by helping them to receive appropriate support from through seminars, workshops and training programmes. This support would assist them to sharpen their competence and pedagogical competences that would permit quality education delivery. The results of the study would inform the Bono Region Directorate of Ghana Education Service on the extent to which Social Studies teachers' competence in ICT and TPACK influence their instructional practices. This knowledge would guide the directorate to design and carry out in-service training for the teachers to horn their competence in ICT and TPACK. The students in the Bono Region would be the prime beneficiaries of the results of the study in the form of better academic performance in Social Studies. This would occur when the ICT and TPACK competence of Social Studies teachers are improved to enhance their instructional practices. Finally, the findings of the study would throw more lights on the theories and practices of ICT and TPACK by linking theory to practice, and contribute to the instructional practices discourse in contemporary times.

## Methodology

Against the backdrop of four cardinal structures (ontology, epistemology, methodology and axiology) of research paradigm proposed by van Thiel (2022), this study took the ontological position of naïve realists, objectivism as epistemological stance, utilized beneficent as axiological position and quantitative approach as research methodology. Precisely, this study employed the positivist research paradigm since it viewed social phenomenon as an objective reality that is distinct from one's perception and is value free in nature where both the researched and the researcher have no control of the reality (Mariani & Zenga, 2021; Portney, 2020). The cross-sectional descriptive survey design was adopted for the study. This design is consistent with the positivist paradigm and the quantitative approach adopted for the study. This design encompasses gathering data at one point and over a short period to provide a 'snapshot' of the outcome and the characteristics associated with a population at a specific point in time (Cohen et al., 2018).

The rationale for the adoption of this research design is that it relies on large-scale data from a representative sample of a population with the aim of describing the nature of existing conditions (Leedy & Ormrod, 2021). The justification concurs with the argument that suggest that cross-sectional descriptive survey design is a non-experimental research design within the quantitative methodology which empowers researchers to determine the effect of one or more variables on another variable through collection of quantitative data (Cohen et al., 2018; Creswell & Creswell, 2018). Consistent with this view, this study collected quantitative data to ascertain the nature of existing conditions as well as testing for the effect of TPACK on teachers' classroom instructional practices. Moreover, the study employed quantitative approach due to the deductive approach adopted which involved testing of hypothesis as well as predicting the effect among variables (Portney, 2020; Roni, Merga & Morris, 2020) which was consistent with the focus of the study. Census sampling was used to select all the 342 Social Studies teachers in the Senior High schools in the Bono Region. Scholars recommend the use of census sampling because it epitomizes the actual attributes of the population, hence guarantees generalization of findings to the population than when a sample is used (Scharrer & Ramasubramanian, 2021).

The instrument for the study was questionnaire which was adapted and whose validity and reliability was accessed using Cronbach alpha through pre-testing. Specifically, data were collected by an adapted versions of Schmidt et al's (2009) TPACK Questionnaire, Raob et al., (2012) ICT Competency Questionnaire and Lawal (2012) and Kukkk and Talts (2007)

Teachers Professional Skills Questionnaire. The questionnaires were structured and required participants to circle only one option to reflect their perception measured on a 5-point likert scale such that 1= Strongly Disagree, 2= Disagree, 3= Undecided, 4= Agree, and 5= Strongly Agree. The Cronbach alpha reliability coefficients for TPACK, ICT Competency and Teachers' Professional Skills questionnaires were 0.89, 0.87 and 0.86 respectively and this resonated with Verma and Abdel-Salam's, (2019) proposal of Cronbach alpha coefficient being  $\geq 0.7$  to be indicative of acceptable reliability. Hence, it could be realized that the various items and constructs in the questionnaire were reliable.

After satisfying assumptions underlying the use of parametric data such as normality, homogeneity, multicollinearity and Variance Inflation Factor (VIF) and Tolerance value especially in the case of regression analysis, descriptive statistics (mean and standard deviation) as well as inferential statistics (multiple and stepwise regression) were employed to analyse the data with the aid of Version 28 of Statistical Product for Service Solution (SPSS). The mean scores were interpreted using Nunnally and Bernstein (1994). These scholars interpret mean scores in four levels: 1.00 to 2.00 is very low, 2.01 to 3.00 is low, 3.01 to 4.00 is high, and 4.01 to 5.00 is very high. The ethical issues that were considered in the conduct of this study included access, informed consent, confidentiality, anonymity, deception as well as plagiarism.

### Analysis of Data

This section of the study discusses the findings from the research questions and hypothesis outlined in the study. The section begins with a discussion on the response rate and its justification of being adequate in the study before analysis of the research questions and hypothesis. A total of three hundred and forty-two (342) questionnaires were administered to the respondents, but three hundred and three (303) were retrieved for the analysis, hence, representing 88.5% response rate. This response rate was realized because some of the questionnaires were poorly answered while others had many missing data that could distort the findings of the study. However, this response rate was considered appropriate for the study based on the suggestion of Babie (2020) that a response rate of 50% is adequate in surveys.

### Research Question One: What is the ICT competency level of Social Studies teachers in Senior High School in the Bono Region?

The aim of this research question was to determine the competency level of Social Studies teachers in Information communication Technology (ICT). In this study, Social Studies teachers' competency level in ICT was assessed in their efficacy in basic technology operation, their personal use of technology and teaching of technology as well as the overall efficacy in these three constructs. The results are presented in Table 1.

**Table 1: Descriptive Statistics on Social Studies Teachers' Level of ICT Competency**

Domains of ICT Competency	Min.	Max.	Mean	Std. Dev.	Interpretation
Competency in Basic Technology Operation	1	5	3.81	0.39	High
Competency in Personal Use of Technology	1	5	3.73	0.46	High
Competency in Teaching of Technology	1	5	3.63	0.63	High
<b>Teachers' Overall ICT Competency</b>	<b>1</b>	<b>5</b>	<b>3.71</b>	<b>0.43</b>	<b>High</b>

Source: Survey Data, 2024

The information in Table 1 show that the teachers had diverse perceptions on their competency levels in ICT as indicated in the various domains of ICT outlined in the study. Specifically, the findings reveal that teachers' competency in basic technology operation was rated highest (M=3.81, SD=0.39), followed by personal use of technology (M=3.73, SD=0.46), while their competency in teaching of technology (M=3.63, SD=0.63) was rated the least. Generally, Social Studies teachers in public Senior High schools' overall ICT competency recorded (M=3.71, SD=0.43). Additionally, in checking to see how dispersed the scores were from the mean in the distribution, this study used standard deviation to quantify the variability of the data. Values within  $\pm 3$  indicated that the data were normally distributed (Gravetter et al., 2021; Roni et al., 2020). However, based on the 5-point Likert scale used in the questionnaire where the mean score is 3.0 (1+2+3+4+5/5), it could be said that all the domains of Social Studies teachers' ICT competency outlined in the study were rated high and above average. This implied that Social Studies teachers in Senior High school in the Bono Region are competent in the use of information communication technology.

### Research Question Two: What is the level of technological pedagogical content knowledge (TPACK) among Social Studies teachers in Senior High Schools in the Bono Region?

This research question aimed at determining the level of technological pedagogical content knowledge among Social Studies teachers in Senior High Schools in the Bono Region of Ghana. The mean scores for the various indicators of TPACK were interpreted using Nunnally and Bernstein's (1994) psychometric theory of analyzing and interpreting mean scores in a 5-point Likert scale questionnaire. These scholars interpret mean scores in four levels: 1.00 to 2.00 is very low, 2.01 to 3.00 is low, 3.01 to 4.00 is high, and 4.01 to 5.00 is very high., and the results are presented in Table 2.

**Table 2: Descriptive Statistics for Teachers' TPACK Domains**

Domains of TPACK	Min.	Max.	Mean	Std. Dev.	Interpretation
Content Knowledge	1	5	4.23	1.17	Very High
Pedagogical Knowledge	1	5	4.15	0.55	Very High
Pedagogical Content Knowledge	1	5	4.02	0.91	Very High
Technological Pedagogical Content Knowledge	1	5	3.63	0.81	High
Technological Content Knowledge	1	5	3.63	1.06	High
Technological Pedagogical Knowledge	1	5	3.57	0.80	High
Technological Knowledge	1	5	3.21	0.80	High
<b>Overall TPACK</b>	<b>1</b>	<b>5</b>	<b>3.78</b>	<b>0.57</b>	<b>High</b>

**Source: Survey Data, 2024**

The results in Table 2 reveal that the content knowledge (M=4.23, SD=1.17), pedagogical knowledge (M=4.15, SD=0.55), pedagogical content knowledge (M=4.02, SD=0.91) were all rated very high while, technological pedagogical content knowledge (M=3.63, SD=0.81), technological content knowledge (M=3.63, SD=1.06), technological pedagogical knowledge (M=3.57, SD=0.80), and technological knowledge (M=3.21, SD=0.80) were all rated high. Collectively, teachers' technological pedagogical content knowledge yielded a mean of 3.78 (SD=0.57) and was deemed high. The standard deviation scores fell within  $\pm 3$  indicating that the data were normally distributed. Even though the content knowledge was dominant and, therefore, rated highest among the teachers, the results suggest that the teachers rated having

all the TPACK domains and they apply them in their classroom instructional practices in their schools.

### Research Question Three: What is the effect of Technological pedagogical content knowledge on Social Studies teachers' classroom instructional practices in Senior High schools in the Bono Region?

This research question investigated the extent to which technological pedagogical content knowledge of Social Studies teachers' predict their classroom instructional practices in Senior High schools in the Bono Region. Multiple regression was employed to provide answers to this research question. Multiple regression aims to ascertain how much in variance is explained by the predictor variables in the dependent variable. Accordingly, in this study, predictor variables included were technological pedagogical, content knowledge, content knowledge, pedagogical content knowledge, technological knowledge, pedagogical knowledge, technological content knowledge, technological pedagogical knowledge whereas the dependent variable was classroom instructional practices of teachers. The results from the multiple regression analysis are presented in Table 3.

**Table 3: Model Summary of Multiple Regression Results for TPACK Domains Influencing Teachers' Classroom Instructional Practices**

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate	R <sup>2</sup> Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	0.632 <sup>a</sup>	0.436	0.389	0.472	0.436	32.420	7	296	0.000

a. Predictors: (Constant), Technological Pedagogical Content Knowledge, Content Knowledge, Pedagogical Content Knowledge, Technological Knowledge, Pedagogical Knowledge, Technological Content Knowledge, Technological Pedagogical Knowledge

b. Dependent Variable: Teachers' Overall Classroom Instructional Practices

The multiple regression results in Table 3 reveal that Social Studies teachers' technological pedagogical content knowledge (TPACK) collectively accounted for 43.6% to their classroom instructional practices which was considered to be statistically significant [ $F(7, 296) = 32.420, p < 0.05$ ]. This result implied that other factors not included in this study were responsible for 56.4% influence for their classroom instructional practices. Based on these results, it was evident that together, technological pedagogical content knowledge is a good predictor of Social Studies teachers' classroom instructional practices in Senior High Schools in the Bono Region.

The study further examined the influence of each domain of TPACK as predictor to their classroom instructional practices, and the results are presented in Table 4. The results in Table 4 show that all the technological pedagogical content knowledge domains contributed significantly to teachers' classroom instructional practices. Indeed, the results indicated that technological knowledge ( $\beta = -0.153, t = -4.306, p = 0.022$ ), content knowledge ( $\beta = 0.132, t = 2.198, p = 0.029$ ), pedagogical knowledge ( $\beta = 0.092, t = 4.237, p = 0.000$ ), pedagogical content knowledge ( $\beta = 0.052, t = 5.987, p = 0.004$ ), technological content knowledge ( $\beta = -0.153, t = 4.118, p = 0.002$ ) technological pedagogical knowledge ( $\beta = -0.003, t = -5.039, p = 0.003$ ), and technological pedagogical content knowledge ( $\beta = 0.095, t = 7.258, p = 0.000$ ), made significant unique contribution to teachers' classroom instructional practices in the Bono Region.

**Table 4. Standardized and Unstandardized Coefficients for TPACK Domains Influencing Teachers' Classroom Instructional Practices**

Model	Unstandardized Coefficients		Standardized Coefficients		Collinearity Statistics		
	B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1 (Constant)	3.446	0.136		25.291	0.000		
Technological Knowledge	-0.056	0.024	-0.153	-4.306	0.022	0.702	1.424
Content Knowledge	0.033	0.015	0.132	2.198	0.029	0.868	1.153
Pedagogical Knowledge	0.049	0.035	0.092	4.237	0.000	0.707	1.414
Pedagogical Content Knowledge	0.017	0.021	0.052	5.987	0.004	0.730	1.370
Technological Content Knowledge	-0.042	0.021	-0.153	4.118	0.002	0.558	1.793
Technological Pedagogical Knowledge	-0.001	0.033	-0.003	-5.039	0.003	0.389	1.568
Technological Pedagogical Content Knowledge	0.034	0.031	0.095	7.258	0.000	0.420	1.382

Source: Survey Data, 2024

### Test of Hypothesis

H<sub>O1</sub>: Teachers' competency in ICT will not significantly strengthen the effect of technological pedagogical content knowledge on teachers' classroom instructional practices.

H<sub>A1</sub>: Teachers' competency in ICT will significantly strengthen the effect of technological pedagogical content knowledge on teachers' classroom instructional practices.

This hypothesis evaluated whether Social Studies teachers' competency in ICT will significantly strengthen the effect of technological pedagogical content knowledge on their classroom instructional practices in Senior High Schools in the Bono Region. The stepwise multiple regression was used to provide answers to this hypothesis, and the results are shown in Table 5.

**Table 5: Stepwise Regression Results for the Effects of ICT Competency and TPACK Domains on Teachers' Classroom Instructional Practices**

Model	R	R <sup>2</sup>	Adj. R <sup>2</sup>	Std. Error of the Est.	R <sup>2</sup> Δ	Sig. FΔ	Sum of Squares	Df	Mean Square	F	Sig.
1	0.095	0.009	-0.001	0.292	0.009	0.433	0.235	3	0.078	0.916	0.031
							25.656	300	0.086		
							25.891	303			
2	0.191	0.037	0.024	0.289	0.028	0.004	0.948	4	0.237	2.8405	0.025
							24.943	299	0.083		
							52.891	303			
3	0.257	0.066	0.050	0.285	0.029	0.002	1.710	5	0.342	4.214	0.001
							24.181	298	0.081		
							25.891	303			
4	0.283	0.080	0.061	0.283	0.014	0.035	2.068	6	0.345	4.297	0.000
							23.823	297	0.080		
							25.891	303			

Source: Survey Data, 2024

The stepwise regression results in Table 5 reveal that in Step 1, ICT competency contributed 9.5% to Social Studies teachers classroom instructional practices which was found to be statistically significant [F (3, 300) = 2.9602, p=0.031] at 0.05 alpha level. The inclusion of content knowledge in Step 2 accounted for 19.1%% in teachers' classroom instructional practices, reaching statistically significance [F (4, 299) = 2.8405, p=0.025] at 0.05 alpha



level, indicating that content knowledge made an additional significant contribution of about 9.6% to Social Studies teachers' classroom instructional practices. The introduction of technological content knowledge in Step 3 resulted in 25.7% variance in Social Studies teachers' classroom instructional practice that reached statistical significance [ $F(5, 298) = 4.214, p=0.001$ ], thus showing a significant contribution of 6.6% to the variance in Social Studies teachers' classroom instructional practices to the previous step. In Step 4, the addition of pedagogical knowledge led to 28.3% variance in Social Studies teachers' classroom instructional practices, and assessed as statistically significant [ $F(6, 297) = 4.297, p=0.000$ ]. This shows that pedagogical knowledge significantly added 2.6% of variance in Social Studies teachers' classroom instructional practices. Based on this result, the null hypothesis that "Social Studies teachers' competency in ICT will significantly strengthen the effect of technological pedagogical content knowledge on their classroom instructional practices" is not supported; hence, the alternate hypothesis is supported. The contribution of teachers' ICT competency and TPACK domains is presented in Table 6.

**Table 6: Standardized and Unstandardized Coefficients for ICT Competency and TPACK Domains**

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	3.897	0.186		20.914	0.000		
	Basic Technology Operation	-0.036	0.051	-0.048	-0.706	0.041	0.712	1.405
	Personal Use of Technology	-0.056	0.040	-0.090	-1.399	0.043	0.804	1.243
	Teaching of Technology	0.026	0.033	0.055	0.770	0.442	0.645	1.550
2	(Constant)	3.663	0.201		18.239	0.000		
	Basic Technology Operation	-0.022	0.050	-0.030	-0.445	0.031	0.706	1.417
	Personal Use of Technology	-0.069	0.040	-0.110	-1.732	0.035	0.794	1.259
	Teaching of Technology	0.040	0.033	0.086	1.201	0.231	0.631	1.585
3	(Constant)	3.869	0.209		18.496	0.000		
	Basic Technology Operation	-0.038	0.050	-0.051	-0.760	0.034	0.698	1.432
	Personal Use of Technology	-0.092	0.040	-0.147	-2.296	0.022	0.767	1.304
	Teaching of Technology	0.063	0.034	0.136	1.878	0.061	0.599	1.670
	Content Knowledge	0.050	0.015	0.201	3.450	0.001	0.920	1.087
4	(Constant)	3.662	0.230		15.937	0.000		
	Basic Technology Operation	-0.037	0.049	-0.049	-0.739	0.030	0.698	1.432
	Personal Use of Technology	-0.092	0.040	-0.147	-2.305	0.022	0.767	1.304
	Teaching of Technology	0.059	0.034	0.126	1.752	0.041	0.597	1.676
	Content Knowledge	0.040	0.015	0.161	2.641	0.009	.831	1.203
	Technological Content Knowledge	-0.055	0.016	-0.200	-3.390	0.001	.892	1.121
	Pedagogical Knowledge	0.068	0.032	0.127	2.113	0.035	.859	1.164

**a. Dependent Variable: Teachers' Overall Classroom Instructional Practices**

1. Predictors: (Constant), Teaching of Technology, Personal Use of Technology, Basic Technology Operation
2. Predictors: (Constant), Teaching of Technology, Personal Use of Technology, Basic Technology Operation, Content Knowledge
3. Predictors: (Constant), Teaching of Technology, Personal Use of Technology, Technology Operation, Content Knowledge, Technological Content Knowledge
4. Predictors: (Constant), Teaching of Technology, Personal Use of Technology, Basic Technology Operation, Content Knowledge, Technological Content Knowledge, Pedagogical Knowledge

In assessing the relative contributions of Social Studies teachers' ICT competency and TPACK domains as shown in Table 6, it could be observed that in model 1, it was basic technology operation ( $\beta=-0.048$ ,  $t= -0.706$ ,  $p<0.05$ ), and personal use of computer ( $\beta=-0.90$ ,  $t= -1.399$ ,  $p<0.05$ ) that made significant contributions to the Social Studies teachers' classroom instructional practices. In model 2, it could be observed from Table 6 that it was basic technology operation ( $\beta=-0.30$ ,  $t= -0.445$ ,  $p<0.05$ ), personal use of computer ( $\beta=-0.110$ ,  $t= -1.732$ ,  $p<0.05$ ) and content knowledge ( $\beta=0.170$ ,  $t= 2.923$ ,  $p<0.05$ ), that made significant contributions to the Social Studies teachers' classroom instructional practices. Again, in model 3, it could be observed that basic technology operation ( $\beta=-0.051$ ,  $t= -0.760$ ,  $p<0.05$ ), personal use of computer ( $\beta=-0.147$ ,  $t= -2.296$ ,  $p<0.05$ ), content knowledge ( $\beta=0.201$ ,  $t= 3.450$ ,  $p<0.05$ ) and technological content knowledge ( $\beta=-0.179$ ,  $t= -3.064$ ,  $p<0.05$ ) made significant contribution to Social Studies teachers' classroom instructional practices.

Finally, it could be observed in model 4 that basic technology operation ( $\beta=-0.049$ ,  $t= -0.739$ ,  $p<0.05$ ), personal use of computer ( $\beta=-0.147$ ,  $t= -2.305$ ,  $p<0.05$ ), content knowledge ( $\beta=0.0161$ ,  $t= 2.641$ ,  $p<0.05$ ), technological content knowledge ( $\beta=-0.200$ ,  $t= -3.390$ ,  $p<0.05$ ) and pedagogical knowledge ( $\beta=0.127$ ,  $t= 2.113$ ,  $p<0.05$ ) made statistically significant contributions to the Social Studies teachers' classroom instructional practices. It could be concluded that basic technology operation, personal use of computer, content knowledge, technological content knowledge and pedagogical knowledge are the domains that need to be bolstered to improve their classroom instructional practices among Social Studies teachers in Senior High schools in the Bono Region of Ghana.

## Discussion of the Results

The aim of the first research question was to investigate the competency level of the Social Studies teachers in using ICT. In this study, the competency level of teachers in using ICT was assessed in their basic technology operation, personal use of technology and teaching of technology. The finding disclosed that the Social Studies teachers exhibited high competency levels in all the three indicators of their competency. This finding concurs with the results of previous studies which established those teachers demonstrated high levels of competency in ICT (Batan et al., 2022; Dutta et al., 2022; Molla & Islam, 2019; Özdemir, 2017). The results of this study affirm the outcome of earlier studies which revealed high competency level among teachers in the various indicators employed. The findings of this study concur with the policy frameworks and position espoused by scholars to the effect that teachers ought to be competent in this digitalized era where technology is unavoidably inherent in all spheres of endeavors just like education. However, the findings from research question one in this study contradicts that of previous researchers who disclosed moderate or intermediate (Fuente & Biñas, 2020) and low (Ngeno et al., 2020; Omito et al., 2019) competencies among the teachers involved in those studies.

Indeed, the point is made that when teachers are competent in the use of ICT, they are able to demonstrate knowledge, skills and have a clear understanding and ability to integrate technology into instructional activities that are tailored towards children in their learning tasks responsive to the pace of the 21<sup>st</sup> century learners. In fact, the high competency levels demonstrated by the Social Studies teachers along the various indicators point to the fact that, they have basic knowledge about computer and other technology devices, software and hardware devices and its accompanying storage devices that are critical in teaching and learning. Besides, it also points to the effect that teachers can successfully teach subject matter while integrating technological concepts and skills. Conversely, incompetent levels in

ICT makes teachers to be unable to motivate their students as well as help them in their learning by integrating ICT in their instructional activities. Therefore, it is consistent to conclude that the effectiveness of the teachers in the classroom will improve if the ICT competencies of the teachers are enhanced.

The second research question sought to find out the level of knowledge in relation to TPACK among Social Studies teachers in Senior High schools in the Bono Region of Ghana. The findings show that aside content knowledge, pedagogical knowledge and pedagogical content knowledge which were rated very high all the other indicators of TPACK were rated high including the overall TPACK which was also deemed high with a mean score of 3.78 and a standard deviation of 0.57. This implies that, the Social Studies teachers were knowledgeable in the various indicators of TPACK and therefore, applied their knowledge in TPACK constructs in their instructional delivery in their classrooms. The finding of this study is consistent with findings of previous studies (Nyamekye et al., 2022; Cheng et al., 2020; Valtonen et al., 2019; Zhang et al., 2019) where the researchers reported high knowledge levels in relation to TPACK. Contrary, findings from previous studies (Abdulai, 2021; Apau, 2017; Yalley, 2017) disclosed low levels of knowledge of teachers on TPACK and therefore, concluded that teachers involved in these studies lacked the requisite knowledge on TPACK, hence, were not very much prepared in integrating this knowledge in their instructional practices in the classroom.

In relation to the third research question, this study explored the effect of the Social Studies teachers' knowledge of TPACK on their classroom instructional practices, and the results show that Social Studies teachers knowledge of TPACK statistically and significantly predicted their classroom instructional practices. This finding resonates with the results of previous studies which established that knowledge of TPACK influenced classroom instructional practices (Dikmen & Demirer, 2022; Manzuoli et al., 2019; Garcia-Esteban et al., 2021). The results of this study affirmed the outcome of earlier studies that knowledge in TPACK is vital to enhancing the classroom instructional delivery of teachers. The implication of this findings suggests that having good knowledge in TPACK constructs enhances teachers' proficiency in basic knowledge in technology, their personal use of technology as well as their efficacy to use innovative technological pedagogies during teaching with the students being the ultimate beneficiaries. Conversely, teachers with non-proficient knowledge or low knowledge in the various dimensions of TPACK constructs are unable to motivate their students during classroom instruction and could throttle their efficacy in classroom and cause a dip in the performance of students. Therefore, it is consistent to conclude that the effectiveness of teachers in the classroom will improve if they are proficient and knowledgeable in the various dimensions of TPACK and apply them during their instructional delivery.

The findings from the study's hypothesis disclosed that the Social Studies teachers' competency in ICT strengthen the effect of TPACK on their classroom instructional practices in Senior <high schools in the Bono Region of Ghana. This finding implies that the influence of TPACK on Social Studies teachers' classroom instructional effectiveness will further be bolstered by their competence in ICT. Previous studies such as those of Aslam et al. (2021) and Zipke (2018) revealed that the effect of teachers' knowledge of TPACK on their classroom effectiveness is further strengthened by the competence in the use of ICT. Hence, this study has established that having knowledge in TPACK is necessary but being competent in the use of ICT will be an added advantage in enhancing the classroom instructional delivery.

## Conclusions and Recommendations

The outcome of this empirical study has produced contextual finding to validate the theoretical assumption that competence in the use of ICT as well as good knowledge in TPACK is crucial in enhancing effectiveness and efficiency of teachers in their classroom instructional practices. Therefore, there is ample evidence to conclude that teachers become conscious and apply seriousness in enhancing their prowess in ICT and TPACK for improved integration of technology in their instructional delivery. With this revelation, it is recommended that the Bono Regional Directorate of Education should liaise with seasoned experts and specialist in instructional design to organise in-service and refresher training programmes for teachers on how to update their ICT and TPACK prowess so as to sustain, improve, and intensify its application in their instructional practices in Senior High schools in the Region. The high competence in the use of ICT and TPACK among the teachers as disclosed in the study imply that the teachers were professionally well equipped to discharge their instructional responsibilities effectively by integrating technology in their instructional delivery. As part of their professional competencies and TPACK capabilities, they were competent in basic technology operations, personal use of technology and teaching of technology as well having knowledge in the various domains of TPACK, implying that, the Social Studies teachers saw themselves as possible agents who possessed adequate knowledge in school curriculum, subject content, and teaching methods, techniques and strategies who are ready to teach and instill the 21<sup>st</sup> century competencies to the learners so as to navigate through the ever-changing society. Accordingly, this study recommended that the Bono Regional Education Directorate encourages the teachers to be dynamic and keenly participate in seminars and continuous professional development programmes so as to preserve and deepen their ICT and TPACK prowess to be more effective and efficient in their instructional delivery in Senior High schools in the Bono Region of Ghana.

## Research Implications, Limitations and Suggestions for Further Studies

The findings of this study imply that competence in the use of ICT as well as having good knowledge in the various dimensions of TPACK is a critical determinant of teacher effectiveness in their instructional delivery in the classroom. Therefore, the teachers are required to be receptive to opportunities that focus on equipping them to sharpen their ICT and TPACK capabilities for excellent classroom instructional practices. Additionally, the implication of the combined effect of ICT competence and knowledge in TPACK on classroom instructional practices showed stronger than the individual influence of these variables. Impliedly, strategies aimed at improvement in use of ICT should run concurrently with approaches to enhancing knowledge in TPACK of the teachers for more improved classroom instructional practices. Further in this regard, teachers should be equipped and encouraged to choose instructional methodologies and materials to suit both competence in use of ICT and knowledge in TPACK so as to enhance their instructional delivery.

On limitation, the perception of Social Studies teachers in relation to their use of ICT, knowledge on TPACK and classroom instructional practices represents their personal views at the time of data collection. Even though the study attempted to reduce the degree of subjectivity of the responses through reliability and validity of the instrument used for data collection, the findings reflected the opinions of the respondents through self-reports. Besides, the study was carried out in 2022 academic year. Therefore, as teacher dynamics such as education policies and working conditions, in the schools change, it is likely that

perceptions and practices in the variables included in the study may also change. Besides, the study was carried out among Social Studies teachers in public Senior High schools in the Bono Region which the researcher deemed not representative of the entire Social Studies teachers in Ghana. Therefore, the findings of the study cannot be generalized beyond the scope (Bono Region) of the study. It is, therefore, suggested that because this study was carried out among Social Studies teachers in other public Senior High schools in the country. Therefore, this study should be replicated in other Regions in Ghana so as to generate a complete nationwide view of the situation in the country. Besides, based on the finding that 56.4% in classroom instructional practice was unaccounted for by the study variables, it is suggested that further studies are conducted to ascertain the influence of other variables that could account for effectiveness in classroom instructional practice among Social Studies teachers.

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