

Assessing the Technological Pedagogical Content Knowledge of English Language Teachers in Cape Coast, Ghana

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ABSTRACT: *The study assessed the technological pedagogical content knowledge (TPACK) of public Junior High School English Language teachers in Cape Coast. Triangulation design in the form of mixed methods was used which involved 150 English Language teachers. The simple random sampling technique was used to select the sample of one hundred and fifty (150) out of two hundred and forty (240). A questionnaire and a semi-structured interview guide were used to gather quantitative and qualitative data respectively, and they form the basis for the research. Frequency, means, and standard deviation were used in analysing the quantitative data while the qualitative data were analyzed thematically in line with the research questions. The confidence to teach any aspect of the English Language, and adequate knowledge about the content of the English Language Curriculum of the Junior High School are vital indications that a teacher has command of the content knowledge. Also, the major indicators for the effective application of pedagogical knowledge of the English Language teacher include the ability to manage the classroom effectively, to connect different concepts to enhance students' understanding, to install software programmes for teaching to use popular application software and to use of blogs, Facebook, Twitter to teach students are indications of the teachers' technological knowledge.*

KEYWORDS: Technological pedagogical content knowledge (TPACK), technology integration, pedagogical knowledge (PK), content knowledge (CK), technological knowledge (TK).

INTRODUCTION

The success of every institution greatly depends on the quality of its human resources (Seniwoliba, 2013). Likewise, the quality of teachers in a school to a large extent is a vital part of its success story (Esiya-Donkor & Ofofow-Dwamena, 2014). It is therefore, noteworthy that the recent

development and changes in school curriculum in Ghana are not enough to provide the needed results if the implementers lack competencies to implement the curriculum effectively. The successful implementation of a curriculum is measured by how competent a teacher as the implementer delivers the curriculum (Wedell & Grassick, 2017). The 21st-century classroom requires teachers to combine their competencies of the TPACK component in curriculum delivery.

Governments have made significant efforts to ensure teachers trained and posted to schools are of quality. According to Anamuah-Mensah and Benneh (n.d.), the training of teachers in Ghana over the years took the generalist and subject-training approaches where generalist teachers are posted to the kindergartens and primary 1-6 while the specialist teachers are posted to the junior high schools and senior high schools. Again, the recent introduction of teacher licensure examination by the National Teaching Council which seeks to bring some form of standardisation in qualification to teach in the pre-tertiary schools is a way to prepare teachers for the task (Education Regulatory Bodies Act, 2020, Act 1023). This is phenomenal as according to Asare and Ntim (2014), teacher licensure is a measure to encourage teachers to continually find innovative ways to develop and improve themselves and their professional practice. Some of these innovative ways include research works, conference attendance and participation, workshops attendance, and other continuous professional activities.

Also, a standard-based curriculum (NaCCA, 2020), introduced by the National Council for Curriculum and Assessment, an agency of government responsible for curriculum issues in the pre-tertiary institutions in collaboration with T-Tel, seems to meet the day's demand of the current needs of the society which are geared toward developing and equipping the needed workforce for the country. The curriculum according to NaCCA (2020), ensures that its content is benchmarked to international standards. This requires the teacher to align their teaching to meet the demands of the 21st-century learner. The 21st century classroom teaching and learning integrates technological pedagogical content knowledge (TPACK) of the teacher in lesson delivery. This is a key demand in the curriculum currently being used in the Ghanaian schools. Despite Ghana Education Service's policy that teachers in Ghana should integrate technology in their teaching (ICT in Education Policy, 2015) for which reason personal laptops and continuous professional development training are given to teachers, an informal observation in some public junior high schools in Cape Coast reveal that most of the English Language teachers do not make use of ICT related tools in their instructional activities. This supports the assertion by Apau (2017) that many teachers are unable to integrate technology in their teaching. There have been several studies on TPACK in other subject areas with the focus of teachers in developed economies (Wulansari, et. al., 2020). This according to Atteh et. al. (2020) results in the developing and middle-income economies such as Ghana lacking empirical literature on TPACK of teachers with respect to basic school teachers. Consequently, to the best of the knowledge of the researcher, there seem to be little or no study on TPACK in the teaching of English Language at the Junior High School in Ghana and particularly in Cape Coast Municipality. Hence, the need for this study to assess the

technological, pedagogical, content knowledge of English language teachers in Junior High Schools in the Cape Coast.

LITERATURE REVIEW

21st Century Teaching and Learning

The 21st-century approach to teaching and learning comes with its packages. These packages include project-based learning, collaborative or cooperative teaching and learning, citizenship, leadership and personal responsibility community partnerships, mastery of curriculum and higher order thinking skills, technology and 21st century skills, reporting and celebrations, and fun (Sole, 2015). The emergence of the digital generation has caused a drastic change in teaching methods (Apau, 2017). This implies that the teacher also needs to change the classroom instructions by leveraging on technology to enhance classroom experience. However, teachers do not well exploit their potential as they use them in isolation. Classroom instruction is now characterised by an acceleration of instructional technologies designed to increase classroom efficiency, expand productivity, and eventually enhance students' total learning experiences (Apau, 2017). The teaching of the Ghanaian Junior High School English language curriculum requires that English language teachers incorporate technology in their lessons. Curriculum reforms over the years have recognised the value of English language education and the use of technology in human resource development. Teacher education institutions are mandated to train teachers who are adaptive to a new generation of learners focusing on language proficiency and technology competency (Vo, 2019). Therefore, the teacher's knowledge of technological pedagogical content knowledge (TPACK) is vital to classroom engagement.

Classroom instruction requires the teacher's knowledge of the content (CK) they teach and knowledge of the pedagogical approaches employed in teaching the content (P.K.), as well as the teacher's technological knowledge (T.K.) and adeptness to use the technologies in aiding instruction. Technological pedagogical content knowledge (TPACK) is a total package for effective teaching in the 21st-century classroom (Darsih, et. al., 2019). According to Vo (2019), this demand changes the content of teacher education courses and pedagogical approaches incorporated with new technologies.

As a result, attention to the TPACK component in initial teacher training and in-service continuous professional development for greater efficiency and effectiveness in classroom instruction in the 21st century cannot be over-emphasised. Teachers need a deep understanding of each TPACK knowledge component to integrate them effectively for the benefit of their students. There is, therefore, the need for the teacher to explore available technologies and to harness them in engaging all groups of learners in the class as every learner has an interest of a sort in technology.

According to Apau (2017), TPACK is the knowledge the teacher requires to effectively integrate technology into their teaching and in the content area by teaching the content using appropriate

pedagogical methods and technologies. This implies the seamless integration and blend of the constructs of TPACK by the teacher to maximize their teaching and enhance students' learning. The teacher's competencies to design, develop, control, use and assess I.C.T. systems and processes are critical to the successful integration of technology in the classroom (Sani, 2014). In this regard, "I.C.T. pedagogy is a new methodology whereby teachers effectively integrate I.C.T. into pedagogical and content knowledge to increase students' control of their learning, self-regulation, and collaboration, fundamentally changing the role of the teacher" (Vo, 2019. p.56).

Buabeng-Andoh (2012) argues that technology integration in teaching is affected by personal attributes such as age, gender, and teaching experience. Several studies have established that male teachers use technology more in lessons than female teachers (Mahdi & Al-Dera, 2013). More recent studies have, however, confirmed that there is no meaningful difference between male and female teachers using technological tools (Fomsi & Orduah, 2017; Verma & Dahiya, 2016; Le, 2015).

Changes in education in the 21st century are geared towards a student-centered approach in the context of a technology-inclusive curriculum that promotes students' skills, understandings, beliefs, and values (ISTE, 2008). The appropriate pedagogical practices are required to develop students' creative and critical thinking processes, collaborative work, and confidence (Larson & Miller, 2011), and so teachers need enough confidence to apply I.C.T. successfully in their teaching practice (Hu & McGrath, 2011).

Language Teaching with Information Communication Technology

In English Language teaching, TPACK transcends I.C.T. knowledge and skills. EFL teachers use TPACK to improve the language teaching process. This involves the identification of learner competency to communicate and to understand the role of classroom interactions in using technology to learn and improve English language skills (Chapelle, 2009). Kang et al. (2010) add that it allows teachers to design English language lessons based on real-life situations.

According to Vo (2019), studies suggest that language teachers use technology in the classroom to aid lesson delivery. This corroborates the positions of Nim Park & Son (2009), Li & Ni (2011), and Hassanzadeh, et. al., (2012), who concluded that teachers use fundamental technological applications as teaching, communication, and administrative tools. PowerPoint presentation is the most commonly used application for lesson delivery (Keengwe & Kang, 2013). Dang (2011) also argues that EFL lecturers apply common technological applications such as internet searching, email and PowerPoint, and Microsoft office for lesson preparation and delivery with limited usage. Mind-mapping, educational blogs, and voice threads are under-utilized as teachers see them as complex to use. In a study conducted in Vietnam on EFL teacher educators' adoption and integration of technology, it was found that most teachers used cassette players, overhead projectors, computers, and sometimes audio recorders. This is not different from the other findings earlier discussed.

In a study conducted by Darsih, et. al., (2019), it was found out that English Language teachers' TPACK had significantly changed after engaging in a lesson study. They appreciated their content knowledge, which was reflected in their level of confidence displayed in class during lessons. Regarding their pedagogical knowledge, it was found out that they had higher pedagogical knowledge. This is demonstrated in students' assessment practices, the use of teaching styles to suit different learners, the appropriate use of teaching approaches and classroom management. Darsih et al. (2019) stated that teachers are more aware of different technologies concerning technological knowledge. Again, their confidence in the use of the internet for research purposes has also increased. And they do not relent in using social media to enrich their knowledge of English. More so, teachers in the study were found to know how to integrate effective teaching methods with appropriate modern technologies and design educational activities using technology. They also use social media and learning management systems to engage their students.

The successful integration of TPACK in the language classroom helps to create authentic language environments (Nguyen, 2018). Active independent learning can also not be over-emphasized (Çakici, 2016; Houcine, 2011; Shabaya, 2009). The use of communicative methods in an interactive technological environment increases confidence in learners as they collaborate to practice acquiring foreign language skills.

Again, benefits of TPACK for both teachers and students cannot be overlooked. Students engage more in lessons due to the use of varying videos. Teachers do not have to spend time creating teaching aid, and learners are also inspired as they find the videos interesting (Pham, et. al., 2018). Additionally, Azmi (2017) highlights that the appropriate use of technology in a language classroom motivates learners while turning classrooms into an open digital environment. It also aids in achieving teaching goals (Ertmer et al., 2012b).

In the English Language Curriculum for Ghanaian Junior High Schools, I.C.T. integration has been spelt out as a "teaching tool to enhance deep and independent learning" (NaCCA, 2020, p. xxv). It is expected that through the integration of technology into teaching and learning, teaching and learning processes will be improved, quality of teaching and learning will be improved, and learner-centered pedagogies approaches will be more used. Again, students will collaborate more, be creative, and engage in higher-order thinking skills, inclusivity issues such as ability, language, and gender inequalities will be addressed. One of the core competencies to be developed in learners in Ghana is digital literacy. Learners are to discover, acquire and communicate through I.C.T. to support their learning and make good use of digital responsibility (NaCCA, 2020, p. xxviii).

Challenges Teachers Encounter using I. C. T

The significance of integrating TPACK in the classroom cannot be over-emphasised. However, most teachers have challenges with the use of technology in the classroom. These challenges are categorised into three: perception of teachers about technology, binding school policies, and physical access to technology (Ling Koh, et. al., 2014). This is not different from the position of Chaaban (2014), who asserts that three types of belief; a belief in the value of the use of I.C.T., a

belief that I.C.T. is pedagogically beneficial, and teachers' belief in their ability to master the technology are beliefs of teacher that cannot be ignored.

Vo (2019) explains that teachers who value and believe that I.C.T. integration gives a better learning outcome are sure to apply it in their classrooms. Likewise, if it provides a pedagogical benefit like an improved teaching method, teachers are more undoubtedly to embrace it. And thirdly, teachers who believe they are able to integrate I.C.T. successfully in their teaching are confident to do so. Again, on the perception of teachers as a factor and a challenge to TPACK, it is essential to note that the issue of relevance and benefits for classroom practice is a vital role in teachers' willingness to adopt technology (Ertmer, et.al., 2012a; Mama & Hennessy, 2013) and they will integrate technology with the belief that it will be beneficial to both their students and themselves (Mirriahi, et. al., 2012). According to Abdulai (2021), these factors are the potentials to affect the three components that make up the TPACK model.

Additionally, most teachers do not have the requisite knowledge of the application of classroom technology. Apau (2017) also posits that most teachers cannot integrate technology in their lessons because teacher education programmes geared toward technology are ineffective. The institutions training teachers teach technology in isolation, and many of the teachers who train the teachers are equally deficient in the use of technology.

The issues of infrastructure, effective training, technical assistance, and time discouraged teachers from employing technology in language teaching, and this poses a serious limitation to the application of TPACK (Mohammed, 2015). Hu & McGrath (2011) establish that teachers were unskilled and lacked the confidence to integrate technology into their pedagogical content knowledge hence the call for urgent training of teachers in technology application in pedagogy. Valtonen et al. (2017) argues that teachers should be adequately trained to incorporate technology into their instructions to overcome these challenges successfully. In the same vein, a community of teachers coming together to share experiences in a forum where they will interact and dialogue to help overcome these challenges is highly recommended (Lee & Kim, 2014).

Some others argue that engaging in reflective practice during and after teaching is essential to technology integration (Farrell, 2011; Shoffner, 2009). This implies that the lack of reflective practice on technology could challenge its integration. In support of this view, Nomlomo & Desai (2014) as cited in Vo (2019, p.58) are of the view that "In every sphere of their work, the chartered teacher will review practice, search for improvements, turn to read and search for fresh insights and relating these to the classroom and the school. They will bring to their work more sophisticated forms of critical scrutiny, demonstrate a high capacity for self-evaluation, and a marked disposition to be innovative and improve". This emphasises that critical and reflective practice is an evaluative exercise that teachers need to engage in, especially within the context of technology integration in content and pedagogy.

Objectives of the study:

1. Assess Junior High School English Language Teachers' content knowledge (C.K.) of the Junior High School English Language Curriculum.
2. Assess the pedagogical knowledge (P.K.) of English Language teachers in Junior High Schools in Cape Coast.
3. Examine the technological knowledge (T.K.) of English Language teachers in Junior High Schools in Cape Coast.

METHODOLOGY

A descriptive survey design was used in this study. The rationale for selecting this design was based on the view that it allows the researcher to collect both quantitative and qualitative data (Creswell & Plano Clark, 2006). The researcher used the concurrent-triangulation mixed method approach (Abdi-Rizak, 2017) for the study in order to collect and analyse both qualitative and quantitative data in a single phase. This will enhance, complement, and give an in-depth understanding of the issue under study. The study was conducted in Cape Coast, the central regional capital city of Ghana. Out of a total of 240 Junior High School English Language teachers in Cape Coast schools, a simple random sampling was used to select 150 of them who formed the sample for the study and out of the 150, 20 were conveniently sampled for the qualitative aspect of the study. A questionnaire and an interview guide were used to collect data.

The following mean parameters by Abdulai (2021) was adopted and used to measure the level of knowledge for each construct of the quantitative data in the analysis in chapter four: Very High (4.0-5.0), High (3.1-3.9), Average (2.5-3.0), Low (1.0-2.4).

The breakdown of the 150 respondents by sex indicated that male respondents were 40 (27%) against 110 (73%) females.

The analysis of the teaching experience shows that a greater number of 108 (72.0%) had teaching experience in the range of 11-15 years. It is also observed that 18 (12.0%) had experience between 6-10 years while 9 representing (6.0%) had an experience between 16-20 years and 1-5 respectively. Two (6) of the respondents representing 4.0% had less than a year's teaching experience.

For the educational qualification, a great number of the respondents, 109 representing 72.7% possess a bachelor's degree while 29 of them with the percentage of 19.3 hold Master's degree. Twelve (12) of the respondents hold diploma certificates which represents 8%.

The findings revealed that a total of 60 respondents representing 40.0% were specialised in Basic Education while 45 respondents representing a percentage of 30 had background in General Education. Thirteen (13), representing 8.7.0% had specialisation in English Language.

Respondents with specialisation in Administration, Social Studies, Mathematics and French had 2.0% each respectively which represents 3 respondents each. Eight (8) respondents with the percentage of 5.3 had specialisation in Ghanaian Language while 5 respondents representing a percentage of 3.3% had specialisation in R.M.E. and a percentage of 2.0 representing 2 respondents had specialisation in French, Home Economics, and administration respectively.

The bio-data collected revealed that English Language teachers in Junior High Schools in Cape Coast with diverse backgrounds.

RESULTS AND DISCUSSIONS

Research Question 1 - What is the content knowledge level of Junior High School English Language teachers in Cape Coast?

This research question investigated the level of content knowledge of the respondents in the English Language curriculum they teach. Five areas were outlined. These included the confidence to teach subject area specialisation, adequate knowledge of the content of curriculum, ability to teach or mentor colleagues, conference attendance in subject area and using knowledge to design projects for class. The results of the analysis are presented in table 4.5. with the mean and standard deviation measuring the level of content knowledge of respondents.

Table. 4.5 Content Knowledge Levels of English Language Teachers

Content Knowledge	Minimum	Maximum	Mean	Standard Deviation
I confidently teach any aspect of my subject specialization	1	4	2.03	0.739
I have adequate knowledge about the content of the English Language curriculum	1	5	2.24	0.739
I can help my colleagues with skills and knowledge in my subject area	1	5	2.79	0.710
I attend conferences, workshops, and training in the field of my specialization	1	5	2.26	0.855
I can use my knowledge to design activities and projects for class.	1	5	2.83	0.784
Average Weighted Mean			2.43	0.765

Source: Field Data, 2022; n=150; M=Mean; SD=Standard Deviation

From the results in Table 4.5 revealed that respondents are able to help their colleagues with skills and knowledge in their subject area with (M=2.79, SD=0.710) which is average, followed by the respondents' ability to use knowledge to design activities and projects for class with (M=2.83, S=0.784) which is average. Attending conferences, workshops, and trainings in respondent's area of specialization was rated low with (M=2.26, SD=0.855) while possessing adequate knowledge

about the curriculum they teach had the ($M=2.24$, $SD=0.739$) which is also low. Again, the confidence to teach any aspect of the subject area was also rated low with ($M=2.03$, $SD=0.590$). Considering that, the average mean score is 2.43 with equivalent standard deviation of 0.765, this gives the indication that the content knowledge level of the English Language teachers is low per the mean parameters and the standard deviation used in measuring each construct. The low standard deviation of 0.765, shows that the mean is true and so the content knowledge level of the English Language teachers is low among public junior high school English language teachers in Cape Coast.

From the qualitative data, it was realized that opinions of respondents on their content knowledge level were worrying, which confirms the findings from the quantitative data collected. For instance, a female teacher commented that:

Hmmm! I can only say I am doing my best concerning the curriculum I teach. I am very confused with this whole curriculum thing so for me I read around my topics and then I teach my students what they need to know. Maybe I can give myself 50 percent. I am trying because I have not had any training on the curriculum yet (Respondent #4).

Another female teacher also commented that:

You mean how do I achieve my lesson objectives? I just introduce my lesson and teach my topic. If one or two students get the concept then my objective is achieved. In stating the objective, we write that by the end of the lesson, the student will be able to ... So, if one student alone gets the concept the objective is achieved (Respondent #1).

A male teacher had this to say:

To be frank with you, madam, this is not my subject area. When I came this was the subject available so I had no choice but to teach it. I am still studying and reading a lot so I can give my students the best (Respondent #20).

Another female teacher said:

I majored in R.M.E but you know this is also a reading subject so I manage it. I usually read before I teach so it is not much of a problem like that (Respondent #13).

The views of the English Language teachers above on their knowledge of the curriculum they teach clearly shows that there is a problem. One could clearly find that they are not themselves confident of what they know and are teaching as they have demonstrated inadequate content knowledge in the subject. This can be attributed to their varied background from the subject they teach. Although, they seem to do their best in teaching the subject, they need help to be on top of their game.

These comments portray what the quantitative data shows as they are found to be in line with the quantitative data on the content knowledge level of public Junior High School English Language teachers in Cape Coast.

Research Question 2 - How effectively do Junior High School English Language teachers in Cape Coast apply the pedagogical knowledge in lesson delivery?

The second research question examined how effectively English Language teachers apply pedagogical knowledge in lesson delivery. The indicators outlined are the ability to effectively manage the classroom, ability to connect different concepts to enhance students' understanding, the use of scientific methods to assess students, the ability to use different teaching methods to suits different learners, and familiarity with misconceptions among students and common misunderstandings. The results of the analysis are presented in table 4.6.

Table 4.6: Effective Application of Pedagogical Knowledge

Pedagogical Knowledge	Minimum	Maximum	Mean	Standard Deviation
I am able to manage my classroom effectively	1	4	2.58	0.835
I can connect different concepts to enhance students' understanding	1	4	2.26	0.803
I can assess my students using scientific methods.	1	5	2.42	0.883
I attend conferences, workshops, and training in the field of my specialization	1	5	2.26	0.855
I have the ability to use different teaching methods.	1	4	3.04	1.068
I am familiar with misconceptions among my students and the common misunderstanding	1	5	3.34	1.099
Average Weighted Mean			2.65	0.924

Source: Field Data, 2022; n=150; M=Mean; SD=Standard Deviation

Indeed, the findings in Table 4.6 shows that familiarity with misconceptions among students and common understanding was rated high (M= 3.34., SD=1.099), followed by the ability to use different teaching methods (M=3.04, SD=1.068) which is average, ability to manage classroom effectively M=2.58, SD=0.835 which is also average, while the use of scientific methods to assess students (M=2.42, SD=0.883) which was rated low, and the ability to connect different concepts to enhance students' understanding (M=2.26 SD=0.803) was the least rated and low among the effective ways respondents apply pedagogical knowledge in lesson delivery. The mean was calculated to be 2.65 which is average on the mean parameter, and the standard deviation of 0.924 implies that, the English language teachers are effectively applying pedagogical knowledge in lesson delivery on an average scale.

Analysis of the qualitative data indicated that teachers are able to somehow maneuver their ways around the classroom with their pedagogical knowledge. A female teacher had this to say:

There are several ways I assess my students to evaluate my lesson for feedback. Sometimes I ask that they write what they learnt on a piece of paper in few sentences for me. At times, I give them projects to work on individually and in groups. Beside this all my students have their portfolios. I make them build a portfolio for themselves in each class so at the end of every lesson they have something to put into their portfolios and every two weeks I check on the content of their portfolio to assess their progress in class (Respondent #7).

A male teacher also contended that:

I engage in reflective practice daily after my lessons. I have mentees in my class who help to record the lessons so after the lesson, we sit down to discuss how it went; the strengths and weaknesses and together we discuss how to improve. This helps in choosing better techniques and approaches that will benefit every student and also help in achieving the objectives easily (Respondent #2).

Another male teacher commented that:

As for reflective practice I cannot do away with it because it helps me to plan my next lesson well. I sometimes do recordings of my lesson and later play it to see how well I am faring (Respondent #17).

A female teacher also indicated that:

Before I plan for my lessons, I research on the best approach to use so that everyone can benefit and also make my work easy. I don't just rely on what I learnt from school (Respondent #15).

Again, a female teacher had this to say:

I combine different methods and techniques to drive home my point so every student can be covered. I give them lots of space to explore and I guide them to get what I need them to get. I get them to transfer knowledge from other disciplines into the lessons I teach and I heard some of my colleagues say some students who do not do well in their subjects have started coming up and I believe it is because they found it important to pay attention because in the English Language class, they will be made to transfer knowledge from the other disciplines (Respondent #12).

The comments from the English Language teachers on their effective application of pedagogical knowledge indicate that even though they may have challenges with the content knowledge they seem to somehow have some pedagogical knowledge that they apply in their teaching. Despite the fact that English Language teaching has specific teaching approaches, there are some generic teaching approaches that may equally work and teachers are making use of them to teach their students. For instance, reflective practice is a professional practice that enhances teaching and

learning and teachers who practice it improve on their lessons. Also, the fact that a teacher admits to researching before even planning lessons is a good way to making progress. The comments from the participants indicate that teachers are on top of their pedagogical knowledge and their application in the classroom in public Junior High Schools in Cape Coast.

Research Question 3 - What is the level of knowledge of Junior High School English Language teachers in Cape Coast on technology in the classroom

delivery?

In the third research question, the technological knowledge levels of the English Language teachers were investigated. These include the ability to install software programs needed for their teaching, the ability to use popular software applications such as Word, excel and PowerPoint, the ability to use social media platforms such as Facebook, twitter and blogs to teach, the use of basic devices attached to computer such as projector, scanner, camera, smart blackboard in teaching, and the ability to resolve basic technical problems with a computer and its accessories.

Table 4.7: Effective Application of Technological Knowledge

Technological Knowledge	Minimum	Maximum	Mean	Standard Deviation
I can install software programs that I need for my teaching.	1	5	3.95	1.453
I am able to use popular application software including word, power point and excel	1	5	4.15	1.250
I can use social media platforms such as blogs, Facebook, and twitter to teach my students	1	5	2.83	0.755
I can use basic devices such as projector, scanner, camera smart blackboard attached in teaching	1	4	2.74	0.741
I can resolve basic technical problems with computer and its accessories	1	5	2.83	0.814
Average Weighted Mean			3.30	1.003

Source: Field Data, 2022; n=150; M=Mean; SD=Standard Deviation

It is observed from the findings tabulated in table 4.7 that, respondents, in rating their technological knowledge level, rated very high the ability to use popular application software such as Word, PowerPoint and Excel (M=4.15, SD=1.250), followed by ability to install software programmes needed (M=3.95, SD=1.453) which is high. However, the ability to resolve technical problems with a computer and its accessories (M=2.83, SD=0.814) was rated average as well as the ability to use social media platforms such as Twitter, Facebook and blogs to teach (M=2.83, SD=0.755), and the least rated being the ability to use basic devices attached to a such as projector, scanner,

camera, smart blackboard in teaching ($M=2.74$, $SD=0.741$) was rated average. The mean score is calculated to be 3.30, which is high on the mean parameter used for the study. Considering a standard deviation of 1.003 indicates that, English language teachers in public junior high school in Cape Coast have high technological knowledge and do apply them effectively in their lesson delivery.

The qualitative data explored the views of respondents on their technological knowledge and its use in lesson delivery. One female participant had this to say:

I use PowerPoint to project lessons in my class. It makes me write less on the board and my students also enjoy it because they all see the slides and make their notes. I sometimes take my students to the computer lab for lessons in order for them to access the internet to search for information on topics. I also install educational software I find useful for my lessons (Respondent #10).

Another also commented that:

I mostly use my laptop to go on the internet to show things to my class. There is no projector so I use the laptop and phones. At least it is better than nothing. They enjoy it too (Respondent # 19).

One male teacher also stated that:

To create fun, I created a blog where my students go on weeks for us to interact perform fun activities. I also direct them to my Facebook page to comment and share their views on a thread and also on one another's comments. I assess them as they contribute in these activities (Respondent #8).

Another male teacher stated that:

I have a Facebook page for my students. It is a fun page where we do a lot of educational activities. Sometimes I make them do group works on the page in a fun way (Respondent # 14).

The statements from the respondents suggest that English Language teachers in public Junior High Schools in Cape Coast have adequate knowledge on technology and they equally use them to benefit their classes. This gives the indication that English language teachers who have the technological knowledge and access to technological tools harness the use of these tools to enhance their lesson delivery in a fun way. Creating a blog for class activities and using other social media platforms for class activities is a demonstrable way to proof that the teacher has adequate knowledge in technology and knows how to use it for teaching. These assertions concur with the results of the quantitative data.

The statements from the respondents suggest that English Language teachers in public Junior High Schools in Cape Coast have moderate level of knowledge in technology and also apply them in teaching. This finding confirms the position of Dinh (2015) that English Language teachers technological knowledge includes using and operating general I.C.T. devices and applications, troubleshooting common technical issues, and an ability to adjust to new technologies. The finding also confirms Apau's (2017) assertion that, pre-service teachers may be able to teach with technology when they are finally posted to teach in the classrooms. However, the finding contrasts the claims of Owusu (2014) and Roig-Vila et. al. (2015) that teachers think they know less about technology and therefore are not abreast with emerging technology. Additionally, this finding refutes the position of Mahdi and Al-Dera, (2013) that male teachers use technology more in lessons than female teachers as in this study, males were 40 (27.0%) against 110 (73.0%) females. Therefore, this confirms the position of Fomsi & Orduah, (2017); Verma & Dahiya, (2016); Le (2015) that there is no meaningful difference between male and female teachers; use of technological tools. In the same vein, the finding disproof Buabeng-Andoh (2012) who argues that technology integration in teaching is affected by personal attributes such as age, gender, and teaching experience.

CONCLUSIONS

Technological pedagogical content knowledge is the hallmark of a competent 21st century teacher. An effective teacher in the 21st century has the ability to effectively integrate all the three constructs of knowledge within the TPACK framework, namely: technological knowledge, content knowledge and pedagogical knowledge. Each of these constructs within the framework must be well balanced such that the teacher should have a firm grip on each component. The teacher should not be deficient in any of it as this could affect its effective integration. The ability to determine which methodology to use to teach a content and which 21st century technology help to easily integrate with the chosen method to drive home the content for easy understanding with less stress, should be at the beck and call of the teacher.

It is undesirable for a teacher to have inadequate content knowledge in the subject they teach as this can be dangerous for the students since without the content the teacher has no business in the classroom. Therefore, much attention should be given to the training of teachers for specialised subject areas. When teachers take major courses in subject areas rather than training teachers to handle all courses or subjects, it will help in their acquisition of an in-depth content and pedagogical knowledge, as without a content knowledge a teacher has nothing to offer a student. This will solve the challenge of English Language teachers lacking adequate knowledge in the content of the subject they teach. Apart from initial teacher training, there is the need for regular on-the-job (in-service) teacher professional development to upgrade and update teachers' knowledge in their field of expertise. This is essential as the teacher must be abreast with current information and trends remain relevant. It is useless for a teacher to know all the methodologies in a subject area and be well vexed in technological knowledge when "what to teach" is limited. Both

knowledge in technology and methodology will not yield any results since both a just means of delivery the content which is limited.

In this digital age, the 21st century teacher cannot afford to be left behind in using technology. The students of this age are digital citizens. Teachers therefore need to embrace technology and use it to get students' attention in class. Nowadays, students use social media for all sort of activities. Teachers can equally get students attention on these platforms and engage them on educational activities during and after school hours. This however implies that the teacher must be skillful in the use of these platforms for better interactivity and engagement.

Finally, quarterly training courses in the integration of TPACK should be organised for teachers. This is to serve as a refresher course to those who already have some knowledge in the subject and apply it in their lessons. For those teachers who do not have any knowledge at all in TPACK, the training will introduce and equip them to overcome their challenges in the integration of TPACK.

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