Tracing the Level of TPCK among Secondary EFL Teachers in Bangladesh

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ABSTRACT

The overall English language proficiency level of school learners in Bangladesh presents a gloomy picture despite the initiatives taken in the last two decades to reform English language education. The deteriorating capacity of English as a foreign language (EFL) teacher is often considered a significant barrier to English language education outcomes in Bangladesh. Technological Pedagogical Content Knowledge (TPCK), a framework comprising various knowledge required for enhancing teachers' quality, is a less explored phenomenon among secondary EFL teachers in Bangladesh. The purpose of this quantitative study is to trace the level of TPCK among secondary school EFL teachers in Bangladesh. This paper was conducted through a questionnaire survey of 120 secondary EFL teachers located in metropolitan and suburban areas of Dhaka, the capital city. It is revealed from the study that content knowledge is evident among the highest number of EFL teachers, while pedagogical knowledge is found among the lowest number of teachers. The study also reports a significant influence of teachers' age, gender, experiences and locations on their various knowledge types.

Keywords: *Technological Pedagogical Content Knowledge (TPCK), English as a Foreign Language (EFL), English Language Teaching (ELT)*

Acknowledgement:

Introduction

Since the last two decades of the previous millennium, instruction and learning have taken a new turn towards integrating Information and Communication Technology (ICT). The turning

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was necessitated chiefly owing to the dissatisfaction about and limitations of traditional teaching-learning approaches (Kilbane & Millman, 2005). Despite being late, Bangladesh was also looking for possible alternatives to ensure quality education and, thus, introduced several reform initiatives in the arena of curriculum development, teaching-learning approaches, textbook writing and assessment practices. In Bangladesh, proficiency in English still needs to improve for students at the secondary level (Afroze et al., 2008; Shuchona, 2010; Parvin & Haider, 2012). In addition to, the EFL teachers needed more knowledge of content, pedagogy and technology (Begum et al. 2015). Recently, several researchers argued that keeping technology separated from content and pedagogy was a disservice to our students and propagated misuse and even disuse of educational technology (Hofer& Swan, 2008-2009). According to Koehler, Mishra and Yahya (2007), teachers' abilities to apply technology have become a critical factor in improving the quality of education and stimulating educational reform. The present situation is far from the desired level in Bangladesh. Khan, Hasan and Clement (2012) stated that a lack of knowledge regarding the use of ICT and a lack of skill in ICT tools and software have also limited the use of ICT tools in teaching-learning situations in Bangladesh. Isolated teachers training on pedagogy and technology could not make positive changes in the EFL teaching-learning situation in Bangladesh. Educational technology cannot work in a vacuum. It works along with pedagogical knowledge and content knowledge.

Effective teaching is an art that requires a combination of knowledge about the learners, the educational context, and the educational objectives and values. Mishra and Koehler (2006) proposed a new theoretical framework known as TPCK. The researchers also stated that teachers must navigate the interplay among technology, pedagogy, and content knowledge that make a core transformative mental knowledge. TPCK has a significant impact on every unique teaching-learning situation. Several researchers reported the significance of TPCK in fostering technology integration in the teaching-learning process (Kazu & Erten, 2014; Liang et al., 2013; Santos & Castro, 2014; Valtonen, 2017, 2019).

The English language is one of the critical factors leading to further education, better employment, and higher social positions in Bangladesh (Khan & Chaudhury, 2012; Roshid, 2018). The present situation is far from the above desired level. To meet the desired level, this study explores an alternative EFL teacher-training program following TPCK framework where technology, pedagogy and content knowledge could be work in integrated manner and highly transformative in every unique situation.

Literature Review
Language situation in Bangladesh

A significant reform initiative in Bangladeshi schools was marked by the commencement of Communicative Language Teaching (CLT) in English language teaching, replacing the age-old Grammar Translation Method (GTM) in 1996. The introduction of CLT in English language

teaching aimed to improve the communicative competencies of secondary-level students in Bangladesh. Therefore, Continuous Professional Development (CPD) training focused on pedagogy and Digital Content Development (DCD) training focused on technology initiated for secondary EFL teachers. However, the overall scenario was not yet satisfactory (Afroze et al., 2008; Haider & Chowdhury, 2012a, b; Shuchona, 2010). The contributions of CLT to English language learning in Bangladesh have been rather questioned by many researchers (e.g. Ali & Walker, 2014; zjs,of & Hasan, 2012; Kirkword & Rae, 2011; Rahman, 2015).

Moreover, the teachers needed to be adequately qualified to implement CLT in their classrooms (Begum et al., 2015; Karim et al., 2018). Although the National Curriculum (2012) recommended using technology in classrooms to enhance students learning, integrating technology into education can only partially spell the students' successful language and literacy development. It is argued that teachers have a significant role in directing the context in which technology can function and facilitate learning (Anwaruddin, 2015), which calls for embracing the critical relationships among content, pedagogy, and technology. This relationship between content, pedagogy, and technology is particularly crucial in Bangladesh, which requires a process to break free from its stagnant position. According to Lewin (1952), unfreezing (before implementing change) involves analyzing the current situation, increasing driving forces, and decreasing restraining forces. Therefore, the study tried to trace the level of secondary EFL teachers' various kinds of knowledge that are instrumental in increasing their driving forces.
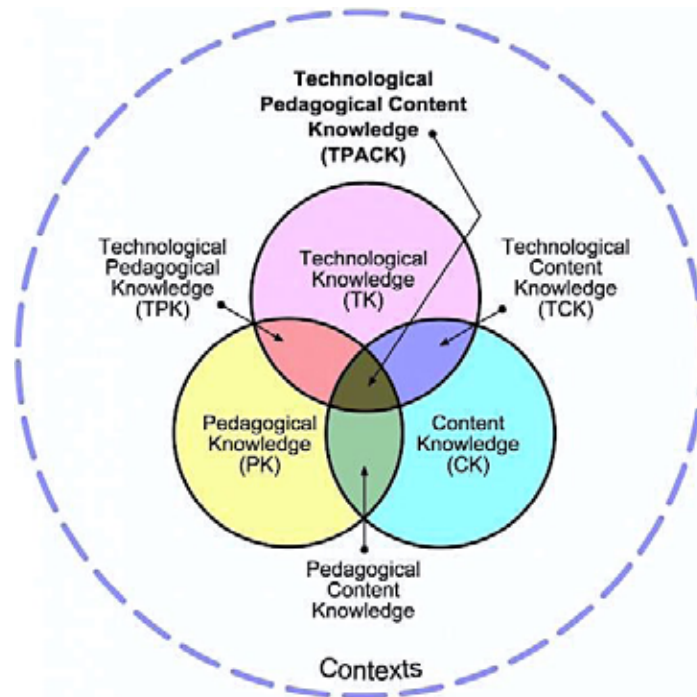
TPCK Framework

The Technological Pedagogical Content Knowledge (TPCK) framework is a relatively new idea to explain teachers' quality. The framework draws on Shulman's theory of Pedagogical Content Knowledge (PCK) in 1986. According to Shulman, P (Pedagogy) and C (Content) together make Pedagogical Content Knowledge (PCK). Shulman (1986) considered PCK as the foundation of teaching capacity, which covers content knowledge, pedagogical knowledge, current curriculum knowledge, knowledge of the learners and their characteristics, knowledge of the educational context, and knowledge of the educational objectives and values. Later, Mishra and Koehler (2006) integrated technology into Shulman's notion of PCK and introduced this new theoretical framework, Technological Pedagogical Content Knowledge (TPCK). They illustrated TPCK as a model connecting three knowledge categories, Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK), which are integrated to form Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Pedagogical Content Knowledge (PCK) in the first context. Again, the three mental knowledge interplay and finally form a complex core knowledge, which is called Technological, Pedagogical Content Knowledge (TPCK). Teachers who can effectively navigate the interplay between technology, pedagogy, and content knowledge have a more significant impact on student learning than simply possessing expertise in a particular area. The

Integrated knowledge reinforces a process of understanding technology within the context of pedagogy and content rather than an isolated set of knowledge. TPCK has received tremendous support in instructional technology for its dynamic nature.

Figure 1

The TPCK framework (Mishra & Koehler, 2006)

Puniya Mishra revised the earlier version of the TPCK framework in 2019. The researcher argued that there is a semantic inconsistency in this highly reproduced, canonical image of TPCK, which can be addressed by a relatively minor but essential component for the TPCK diagram. Mishra (2019) also argued that the outer dotted circle labeled "Contexts" is not designated as a form of knowledge. Mishra (2019) renamed the dotted circle as "Contextual Knowledge (XK)" (i.e., the teacher's knowledge of the context) to resolve this.

EFL and TPCK

In a TPCK study, Archambault and Crippen (2009) revealed that the participants had a high level of pedagogical content knowledge but a low confidence level when a technological component was added. Terpstra (2009) stated, preservice teachers' technological knowledge

level was higher than Technological Pedagogical Knowledge. However, the TPK level was higher than TPCK. The researcher also added that females were better than males regarding their PK. In another study, Ekrem and Recep (2014) reported that females were better than their male colleagues considering all TPCK factors. Lee and Tsai (2010) reported that senior teachers had lower confidence levels regarding technology. However, Koh and Sing's (2011) analysis found no influence of demographic factors like age and gender on teachers' TPCK. Köse (2016) showed that the TPCK mean scores were at the lowest level among the other components of the TPACK model. The findings revealed that the participants' primary TK, PK, and CK were unequal. In the Bangladeshi context, Rahman and Pandian (2018) revealed that the teachers' knowledge level was not equal and high sometime depending on location, age, and gender.

Moreover, researchers have pointed out that not all technological solutions may apply to every teacher, course, or view of teaching (Mishra & Koehler, 2006). The TPCK model is unique in different situations. A strong TPCK requires the highest level of CK, a medium level of PK, and the lowest level of TK (Angeli & Valanides, 2015) that can expand EFL teachers' professional knowledge in different teaching stages, such as curriculum planning, implementation, and evaluation processes.

Method
Data collection and analysis

The study gathered data through a self-reported survey regarding EFL teachers' knowledge level (Sahin, 2011) and other demographic factors such as participants' gender, age, and location (Ahsan et al., 2022).

This study analyzed the collected quantitative data using descriptive and inferential statistics. Descriptive statistics such as frequency distributions and percentages were calculated to provide an overview of the data. Bivariate analyses, including cross-tabulations based on essential demographic variables, were also conducted to meet the study objectives. Chi-square tests were utilized for detecting significant differences between the groups, with tests considering significant at a 5% significance level. Additionally, knowledge scores were calculated for each item to determine the respondents' knowledge levels. The median score categorizes respondents as having adequate knowledge if they scored above the median for a given item. All of the data analysis was carried out using SPSS version 20.

Scopes and limitations

This study was based on the TPCK framework of Mishra & Koehler (2006) although an updated version of the TPCK came later by Mishra (2019). Moreover, the research design is only kept limited to teacher's self reported perceptions of their TPCK levels. The sampling for surevy has been done purposively for the convenience of the reserchers because of the time and finacilal

contraints. For this reason the findiungs from the data may not be genaralised.

Findings
The demographic characteristics of participants

The different background characteristics of the respondents in terms of age group, sex, residence, type of institutions, place of institutions, and years of experience have been shown in Table 1 below: The age of the respondents ranged from 25 to 56, and the average age of the respondents was 38.83 years. Almost 54.2% of the respondents were male, and the rest 45.8% were female. Regarding place of residence, 15.0% of respondents from rural areas participated in the survey, and the remaining 85.0% were interviewed from urban areas. Based on their management status, educational institutions were classified into two groups: private (47.5%) and government (52.5%). Notably, most (70.0%) of the respondents worked in the capital city, while only 6.7% and 21.7% worked at district and Upazila levels, respectively.

Table 1: Demographic characteristics

	Characteristics	No. of respondents	Percentage %
Age Group	Below 30 years	26	21.7
	31-40 years	43	35.8
	41-50 years	42	35.0
	Above 50 years	9	7.5
Sex	Male	65	54.2
	Female	55	45.8
Type of Institution	Private	57	47.5
	Government	63	52.5
Location of Institution	Capital	84	70.0
	District	8	6.7
	Upazila	26	21.7
Place of residence	Rural	18	15.0
	Urban	102	85.0

Technological Knowledge (TK)

The study used 15 questions to explore teachers' knowledge levels about technology. The scores of all questions regarding technological knowledge have been summed up to find the respondents' knowledge level. The study showed that around 60.8% of respondents had adequate knowledge regarding technology (TK), and the rest, 39.2%, needed adequate knowledge about it.

Table 2: TK score of the participants

	Frequency	Per cent	Valid Percent	Cumulative Percent
No Knowledge	47	39.2	39.2	48.3
Have Knowledge	73	60.8	60.8	100.0
Total	120	100.0	100.0	

Technological Knowledge (TK) by Participants' demographic characteristics

The study found that the types and locations of participants' institutions and their places of residence had significant associations ($p<0.05$) with their technological knowledge level. As shown in Table 3, the respondents who worked in government schools had significantly higher technological knowledge than those who worked in private institutions. Regarding the location of their institutions, the respondents who worked in the capital city had significantly higher technological knowledge than those who worked in the city outskirts. Similarly, the respondents who lived in the urban areas had significantly higher knowledge compared to their rural counter group. However, no significant relationship was found between participants' technological knowledge and age or gender (see Table 3).

Table 3: TK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge %	p-value
Age	Below 30	38.5	61.5	0.518
	31-40	46.5	53.5	
	41-50	35.7	64.3	
	Above 50	22.2	77.8	
Sex	Male	40.0	60.0	0.839
	Female	38.2	61.8	
Type of Institution	Private	49.1	55.9	0.034
	Government	30.2	69.8	
Place of Institution	Capital	00.0	00.0	
	District	75.0	25.0	
	Upazila	46.2	53./8	
Place of Residence	Rural	66.7	33.3	0.010
	Urban	34.3	65.7	

Pedagogical Knowledge

The study used five different questions to find the pedagogy level. The scores of all questions regarding pedagogy knowledge were summed up to calculate the respondents' knowledge level. The study found that around 51.7% of respondents had adequate knowledge regarding pedagogy (PK), and the rest, 48.3%, needed it.

Table 4: PK scores of the participants

	Frequency	Per cent	Valid Percent	Cumulative Percent
No Knowledge	58	48.3	48.3	48.3
Have Knowledge	62	51.7	51.7	100.0
Total	120	100.0	100.0	

Pedagogical Knowledge (PK) by Participants' demographic characteristics

The study found that both types and places of institution have a significant association ($p<0.05$) with the pedagogical knowledge level of the respondents. The study also found that the respondents who worked in government organizations had significantly higher pedagogical knowledge than their private organizations counterparts. Regarding the place of an institution,

the respondents who worked in the capital city had significantly higher knowledge of pedagogy than their counter groups. However, it was evident from the study that respondents' age, sex, and place of residence did not have a significant association (p<0.05) with their pedagogical knowledge (see Table 5).

Table 5: PK by different participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge %	p-value
	Age Group			
Age	Below 30	53.8	46.2	0.335
	31-40	53.5	46.5	
	41-50	45.2	54.8	
	Above 50	22.2	77.8	
Sex	Male	50.8	49.2	0.562
	Female	45.5	54.5	
Type of	Private	64.9	35.1	0.001
Institutions	Government	33.3	66.7	
Place of Institutions	Capital	35.7	64.3	0.000
	District	100.0	0.0	
	Upazila	69.2	30.8	
Place of	Rural	45.1	54.9	0.091
Residence	Urban	66.7	33.3	

Content Knowledge (CK)

This study used six questions to find participants' knowledge levels about their teaching content. The scores of all questions regarding the content knowledge were summed up to find the respondents' knowledge level. The study found that around 73.3% of respondents had adequate knowledge regarding Content Knowledge (CK), and the rest, 26.7%, needed adequate knowledge about it.

Table 6: CK score of the participants

	Frequency	Per cent	Valid Percent	Cumulative Percent
No Knowledge	32	26.7	26.7	26.7
Have Knowledge	88	73.3	73.3	100.0
TotalTotal	120	100.0	100.0	

Content Knowledge (CK) by Participants' demographic characteristics

The study found that the types of participants' institutions and places of residence were significantly co-related (p<0.05) with their level of content knowledge. As seen in Table 7, the respondents who worked in government institutions had significantly higher content knowledge than those who worked in private. In terms of place of residence, the respondents who lived in the urban area had significantly higher knowledge compared to their rural counter groups. However, participants' age, sex, and place of institution did not have any significant association (p<0.05) with their level of content knowledge (See Table 7).

Table 7: CK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge (%)	p-value
Age Group	Below 30	38.5	61.5	1.00
	31-40	20.9	79.1	
	41-50	31.0	69.0	
	Above 50	0.0	100.0	
Sex	Male	32.3	67.7	0.129
	Female	20.0	80.0	
Type of Institution	Private	36.8	63.2	0.017
	Government	17.5	82.5	
Place of Institution	Capital	21.4	78.6	0.073
	District	25.0	75.0	
	Upazila	46.2	53.8	
Place of Residence	Rural	21.6	78.4	0.003
	Urban	55.6	44.4	

Technological Pedagogical Knowledge (TPK)

This study used four different questions to find participants' level of Technological Pedagogical Knowledge (TPK). The scores gained from the responses to all questions regarding technological pedagogical knowledge have been summed up to find the respondents' knowledge level. The study found that around 63.3% of respondents had adequate Technological Pedagogical Knowledge (TPK), while the rest, 36.7%, needed more.

Table 8: TPK score of the participants

	Frequency	Percent	Valid Percent	Cumulative Percent
No Knowledge	44	36.7	36.7	36.7
Have Knowledge	76	63.3	63.3	100.0
Total	120	100	100	

Technological Pedagogical Knowledge (TPK) by Participants' demographic characteristics

The study found that the place of institution obtained significant association (p<0.05) with the respondents' knowledge level. The findings showed that the respondents who worked in the capital city had significantly higher knowledge regarding technological pedagogical knowledge than their counterpart groups: age and sex. Types of institutions and places of residence did not have any significant association (p<0.05) with the knowledge level of the respondents in the study (See Table 9).

Table 9: TPK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge (%)	p-value
Age Group	Below 30	38.5	61.5	0.582
	31-40	41.9	58.1	
	41-50	28.6	71.4	
	Above 50	44.4	55.6	
Sex	Male	33.8	66.2	0.486
	Female	40.0	60.0	

Type of Institution	Private	45.6	71.4	0.053
	Government	28.6	54.4	
Place of Institution	Capital	28.6	71.4	0.023
	District	75.0	25.0	
	Upazila	50.0	50.0	
Place of Residence	Rural	36.3	63.7	0.832
	Urban	38.9	61.1	

Pedagogical Content Knowledge (PCK)

The study used seven questions to find participants' level of Pedagogical Content Knowledge (PCK), and the scores obtained from the responses to these questions were summed up to find the respondents' knowledge level. 60.8% of respondents had adequate knowledge regarding Pedagogical Content Knowledge (PCK), and the rest, 39.2% of respondents, did not have adequate knowledge about it (See Table 10)

Table 10: PCK score of the participants

	Frequency	Per cent	Valid Percent	Cumulative Percent
No Knowledge	47	39.2	39.2	39.2
Have Knowledge	73	60.8	60.8	100.0
Total	120	100.0	100.0	

Pedagogical Content Knowledge (PCK) by Participants' demographic characteristics

The study found that types of institutions, place of institutions, and place of residence obtained significant association ($p<0.05$) with the respondents' knowledge level. According to the findings of this study, the respondents who worked in government organizations had significantly higher Pedagogical Content Knowledge (PCK) knowledge than those who worked in private organizations. Regarding the place of institutions, the respondents who worked in the capital city had significantly higher knowledge of Pedagogical Content Knowledge (PCK) than their counter groups. On the other hand, the respondents who lived in the urban areas had significantly higher knowledge than their rural counter groups. Age and sex did not have a significant association ($p<0.05$) with the knowledge level of the respondents in the study (See Table 11).

Table 11: PCK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge (%)	p-value
Age	Below 30	38.5	61.5	0.518
	31-40	46.5	53.5	
	41-50	35.7	64.3	
	Above 50	22.2	77.8	
Sex	Male	40.0	60.0	0.839
	Female	38.2	61.8	
Type of Institution	Private	49.1	50.9	0.034
	Government	30.2	69.8	
Place of Institution	Capital	32.1	67.9	0.021
	District	75.0	25.0	
	Upazila	46.2	53.8	
Place of Residence	Rural	34.3	65.7	0.010
	Urban	66.7	33.3	

Technological Content Knowledge (TCK)

This study used four different questions to find participants' knowledge level about Technological Content Knowledge (TCK), and the scores obtained through participants' responses to those questions were calculated to find their TCK. It was reported from the study that around 58.3% of respondents had adequate knowledge regarding Technological Content Knowledge (TCK), while the rest, 41.7%, needed to have adequate of it (see Table 12).

Table 12: TCK score of the participants

	Frequency	Per cent	Valid Percent	Cumulative Percent
No Knowledge	50	41.7	41.7	41.7
Have Knowledge	70	58.3	58.3	100.0
Total	120	100.0	100.0	

Pedagogical Content Knowledge (TCK) by Participants' demographic characteristics

The study found that only one age group had a significant association ($p<0.05$) with the respondents' knowledge level. According to the findings of this study, the respondents who were 50+ had significantly higher Technological Content Knowledge (TCK) knowledge than the rest respondents. Sex, types of institution, place of institution, and place of residence did not have a significant co-relation ($p<0.05$) with the knowledge level of the respondents in the study (See Table 13).

Table 13: TCK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge (%)	p-value
Age	Below 30	38.5	61.5	0.025
	31-40	30.2	69.8	
	41-50	59.5	40.5	
	Above 50	22.2	77.8	
Sex	Male	40.0	60.0	0.687
	Female	43.6	56.4	
Type of Institution	Private	42.1	57.9	0.926
	Government	41.3	58.7	
Place of Institution	Capital			0.051
	District	75.0	25.0	
	Upazila	30.8	69.2	
Place of Residence	Rural	41.2	58.8	0.795
	Urban	44.4	55.6	

Technological Pedagogical Knowledge (TPCK):

The study used five questions to find the knowledge level of Technological Pedagogical Content Knowledge (TPCK) related to technological pedagogical content. The scores of all questions regarding the technological pedagogical content knowledge were summed up to find the knowledge level of the respondents' technological pedagogical content knowledge. The study showed that the EFL teachers' level of TPCK was 54.2%. It was adequate in terms of the median score of the study.

Table 14: TPCK score of the participants

	Frequency	Per cent	Valid per cent	Cumulative per cent
No knowledge	55	45.8	45.8	45.8
Have knowledge	65	54.2	54.2	100.0
Total	120	100	100	

Pedagogical Content Knowledge (TPCK) by Participants' demographic characteristics

The study showed that age, sex, and types of institutions had significant associations (p<0.05) with the respondents' knowledge level. The respondents' 41-50 age level had significantly higher knowledge than the other categories. The male respondents had significantly higher knowledge than the female ones. The respondents' who worked in government organizations had significantly higher knowledge than those who worked in private organizations. However, neither the place of the institution nor the place of residence had a significant co-relation (p<0.05) with the TPCK level of the respondents (see Table 15).

Table 15: TPCK by participants' demographic characteristics

	Characteristics	No Knowledge (%)	Have Some Knowledge	p-value
Age	Below 30	38.5	61.5	0.000
	31-40	23.3	76.7	
	41-50	73.8	26.2	
	Above 50	44.4	55.6	
Sex	Male	35.4	64.6	0.013
	Female	58.2	41.8	
Type of Institution	Private	35.1	64.9	0.025
	Government	55.6	44.4	
Place of Institution	Capital	44.0	56.0	0.470
	District	50.0	50.0	
	Upazila	46.2	53.8	
Place of Residence	Rural	44.1	55.9	0.369
	Urban	55.6	44.4	

Discussion

The study revealed that the participating EFL teachers had a high level of CK (73.3%), a low level of PK (51.7%), and a moderate level of TK (60.8). However, all those knowledge levels, though were considered adequate based on the median scores. The findings are similar to Parvin & Haider (2012)**.**

Furthermore, in the first level of transformation within the TPCK framework, the level of CK decreased while interplaying with TK and PK in the domain of TCK (58.3%) and PCK (60.8%). The result indicates that the teachers may have a good command of the subject knowledge but must be more confident about correlating pedagogy, technology, and content knowledge in their teaching practices. The result highlights the importance of providing professional development and support to help teachers build their pedagogical and technological competence and confidence. Hence, it is imperative to transform content knowledge into instructions for presenting a subject differently based on needs, which supports the link between curriculum, assessment, and pedagogy (Shahin, 2011). Koehler and Mishra (2009) stated that teachers must determine the most suitable technology matches for addressing specific subject matter in different domains and decide how the content affects the choice. (. In the second level of transformation within the TPCK framework, the study also revealed that the teachers' more complex mental knowledge of TPCK (54.2%) formed by interplaying TPK, PCK, and TCK was the teachers' core task. The knowledge was also adequate in terms of the median score. It is similar to Archambault & Crippen (2009) and different from Angeli and Valanides (2015). The researchers also reported that the TPCK level would expand when the CK level is the highest, the PK level would be the medium, and the TK level would be the lowest primary knowledge within the TPCK framework. Significantly, the PK was not at the medium level in the TPCK framework in the study. The study suggests that teacher training would be re-designed to increase the existing TPCK level to create authentic classroom contexts.

The present study also found that government secondary school teachers had significantly higher TK, CK, PCK, and TPCK levels than private secondary schools. One possible explanation for this difference is that government EFL teachers may feel more accountable to higher authorities and may have undergone more rigorous selection processes than private school teachers. It was also found that teachers working in urban areas tended to have higher TK and CK levels than those in rural areas. This finding is consistent with previous research by Afrose, Kabir and Rahman (2008), which highlighted the need to clarify the concept of CLT for English teachers in rural areas of Bangladesh.

Regarding the place of institutions, the teachers who worked in the capital city had higher TK, PK, TPK, and PCK than the others. Furthermore, teacher in above 50 age-group teachers had comparatively high TCK, and teachers between the ages of 41-50 had higher TPCK than the others. It is different from the findings of Lee and Tsai (2010) and Koh and Sing (2011). The

researchers showed no significant difference in age, gender, and the components of TPCK. Rahman and Pandian (2018) supported that the EFL teachers' knowledge level may vary owing to the differences in teachers' location, age, and gender.

The findings also indicate that there needs to be more connection between Bangladesh national curriculum, teacher training, classroom practice, and secondary students. The ELT curricula in Bangladesh for primary, secondary, and higher secondary levels are centrally developed and circulated by the National Curriculum and Textbook Board (NCTB). Hence, the need for teachers to implement the curriculum could be addressed, and the lack of teacher training infrastructure in Bangladesh has added to that catastrophe (Rahman & Pandilan, 2018). Begum, Parvin, and Khan (2015) reported that only 17.08% of teachers performed excellently both pedagogically and technologically after DCD training. The English language curriculum should be re-evaluated in the context of the requirements of local learners and teachers (Ali & Walker, 2014). Rahman and Pandilan (2018) reported that curricular reform should be localized and based on social and classroom needs. Mishra and Koehler (2006) also pointed out that only some technological solutions could be applied to every teacher, course, or view of teaching. A strong TPCK requires EFL teachers to expand their professional knowledge in different teaching stages, such as curriculum planning, implementation, and evaluation processes.

Conclusion

Change is not successfully embedded in the education system of Bangladesh because it is stagnant in the unfreezing stage (Rahman, 2015). The requirements of the teachers implementing the curriculum need to be addressed, and there needs to be better teacher-training infrastructure in Bangladesh (Rahman & Pandilan, 2018). Isolated training on technology and pedagogy, excluding content knowledge, could not increase teachers' quality in Bangladesh. The study also showed that the EFL teachers' primary pedagogical knowledge was the lowest among all primary knowledge and the core TPCK was in the mid-level. Though the content knowledge was relatively high, it could not keep its' status when integrated into another primary knowledge reported in this study. Researchers have shown that a high level of Content Knowledge (CK) is necessary but not sufficient for the development of the remarkable knowledge base of expert teachers known as Pedagogical Content Knowledge (PCK) (Pitjeng, 2014; Rollnick et al., 2008, as cited in Davidowitz & Potgieter, 2016). The curriculum would assess and outline the content, pedagogy, and technology knowledge required for a specific topic. The secondary EFL teachers' integrated training would be designed accordingly. The absence of focus on pedagogy, content, or implementation strategies can result in a lack of perceived success. The National Curriculum, as well as the training program, would be re-designed according to the needs of the teachers. Educational institutions looking toward transforming teaching and learning must ensure that the implementation process include discussions and professional development focused on increasing the instructors' technological, pedagogical, and content

knowledge in integrated, authentic, real-world ways to ensure quality education. Professional development solely focused on the development of technological knowledge will not lead to effective technology integration; technology will not work in a vacuum. TPCK is critical to integrating technology for transformative teaching and learning in the twenty-first century. Knowledge-integrated secondary EFL teacher training is an apparent reality of education in the future. The findings of this study will pave the avenue toward using the TPCK model as the theoretical framework for conceptualizing, planning, and implementing Bangladeshi EFL teachers' professional development initiatives in the future.

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