

Teachers' Technological, Pedagogical and Content Knowledge and Students' Performance in The ESL Classroom

Belmer A. Dagdag; Robin V. Guillermo, Ph.D.

¹Indun Bayabo Integrated School - SDO City of Ilagan

²Isabela State University - Echague Campus

Received 02-06-2024

Revised 03-06-2024

Accepted 26-06-2024

Published 28-06-2024



Copyright: ©2024 The Authors. Published by Publisher. This is an open access article under the CC BY-NC-ND license (<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

Abstract:

Technological Pedagogical and Content Knowledge, often referred to as TPACK, is a conceptual framework that exemplifies the dynamic relationship between technology (T), pedagogy (P), and content knowledge (C) in educational settings. This study sought to explore the potential of TPACK as a holistic framework among the ESL junior high school teachers at the Schools Division of the City of Ilagan, Isabela for the School Year 2023-2024. For this purpose, 54 ESL teachers and 300 ESL students were the respondents of the study. The study used the quantitative approach, particularly the descriptive-correlational method and utilized an adapted questionnaire. The study revealed that the respondents generally agreed with the indicators of TPACK. Also, the findings revealed that the respondents obtained the highest mean rating of 3.47 in Pedagogical Knowledge. Meanwhile, no significant differences were found in the sub-domains of TPACK when grouped according to the teachers' length of teaching experience. Interestingly, the data confirmed that having a high educational attainment does not necessarily translate to better performance in relation to the indicators of TPACK. Moreover, the study revealed that there's no significant evidence on the relationship between teachers' level of TPACK and students' academic performance. This study therefore recommends an in-depth analysis of teachers' TPACK may be carried out using other ways of data collection other than a self-report tool and explore the moderating roles of other variables that might have an influence on teachers' level of TPACK and students' academic performance.

Keywords: Academic Performance, Content Knowledge, Pedagogical Knowledge, Technological Knowledge, ESL Classroom

Introduction:

The Problem and Its Background

In the ever-changing landscape of education, the integration of innovative learning strategies such as the usage of technology and continuous development of teachers' pedagogical and content knowledge are imperative. Technological

Pedagogical and Content Knowledge, often referred to as TPACK, is a conceptual framework that exemplifies the dynamic relationship between technology (T), pedagogy (P), and content knowledge (C) in educational settings. It serves as a useful framework for discerning what knowledge should teachers possess in integrating technology into the learning process and on how to develop such knowledge (Baran et al., 2011). Furthermore,

TPACK exemplifies the significant understanding required by educators to employ the potential of technology effectively and efficiently in creating an environment that is conducive to learning and in providing learning opportunities that will aid in the achievement of pedagogical goals, while addressing the specific demands of the content being taught.

Studies conducted in other disciplines provide significant findings on the importance of developing teachers' TPACK skills. In science instruction, for instance, Muhaimin et al. (2019) suggested that to establish self-efficacy among science teachers in technology integration, initial or basic technology skills and pedagogy must be given prime importance. This signifies that continuing professional development programs allow science teachers to grow in their TPACK (Chatmaneerungcharoen, 2019), which could lead to better students' academic performance. In their recent study, Akturk and Ozturk (2019) discussed that a teacher with a high self-efficacy for TPACK can successfully utilize the most appropriate strategies and technology in teaching a course for the improvement of students' achievement to a particular course.

In the context of English language instruction, educators are challenged to equip students with not only linguistic skills but also the capacity to survive a technology-driven world. This means that language instruction demands a comprehensive set of skills from educators. It is not just confined on teachers' language proficiency; it also demands an understanding of students' diversity. The current state of the world, it also requires a high level of technological competence to utilize modern classrooms that are equipped with digital tools (Abubakir, 2023). It is within this context that the concept of TPACK has gained importance in the second and foreign language classrooms.

In her study, Rajiha (2022) concluded in her study that instructors must continuously develop their TPACK, specifically in integrating all subdomains to improve language teaching and learning. Since teachers with differentiated and integrated knowledge may have greater ability than those whose knowledge is limited and fragmented (Filgona et al., 2020). Also, the study of Azhari and Hashim (2023) exemplified that ESL teachers' high TPACK skills and good attitudes toward technology were perceived as good indicators in terms of technology integration in English instruction and successful language acquisition. However, Drajiati et al. (2018) argued in their investigation on pre-service and in-service teachers' perceptions on the implementation of the TPACK model in the English classroom that in-service teachers require more practice in using the TPACK framework for language learning.

In the Philippine context, most of the studies conducted involved pre-service teachers as respondents. The study of Santos and Castro (2021), for instance, concluded that pre-service teachers in their university have received sufficient knowledge and skills necessary for teaching internship. On the other hand, in the study of Ramos et al. (2020) they found significant difference in the pre-service teachers' TPACK learning experience and practice as well as positive relationship between those aspects of teacher education training. This, therefore, suggests that teacher education institutions should consider redesigning their curricula to accommodate emerging technologies for better teaching and learning of contents and capacitate teachers with trainings that will enhance their knowledge in the different domains of the teaching-learning process. However, most of the trainings provided by the Department of Education (DepEd) are not centered on the TPACK framework.

While there is a significant body of research studies conducted in foreign and local settings exploring the TPACK framework and its effect in different learning areas, the researcher saw the need to further explore the level of TPACK skills among English teachers in the City of Ilagan and investigated how it contributed to the academic performance of their learners. This study sought to explore the potential of TPACK as a holistic framework, as it combines competence in technology, pedagogy, and content all of which are crucial in the delivery of effective and quality instruction in the 21st century.

Statement of the Problem

This study generally aimed to determine ESL teachers' level of TPACK and students' academic performance. Particularly, this study intended to answer the following questions:

1. What is the profile of the respondents in terms of:
 - a. years of teaching experience; and
 - b. highest educational attainment?
2. What is the academic performance of the ESL students of the teacher-respondents?
3. What is the respondents' level of knowledge in terms of:
 - a. technological;
 - b. content;
 - c. pedagogical;
 - d. pedagogical content;
 - e. technological pedagogical;
 - f. technological content; and
 - g. technological pedagogical and content?
4. How significant is the difference in the perceived level of teachers' Technological, Pedagogical, and Content Knowledge when the respondents are grouped according to their profile?
5. How significant is the relationship between the students' academic performance and the respondents' level of TPACK?

Body Text:

Research Design

The study employed a quantitative approach, specifically the descriptive-correlational method. It is descriptive as it illustrated the ESL teachers' level of TPACK. It also described the learners' academic performance. It is at the same time correlational since it investigated as to whether relationship exists among the teachers' TPACK and learners' academic performance.

Respondents of the Study

The respondents of the study were the JHS English teachers at the Schools Division of the City of Ilagan Isabela. The researcher used the formula by Krejcie and Morgan (1970) to compute the sample size, with 95% confidence level and 5% margin of error. Furthermore, the researcher utilized proportionate stratified sampling technique to select the sample respondents randomly.

District	Population	Sample Size	Percentage
West	22	19	35.20
Northwest	10	8	14.81

San Antonio	8	8	14.81
North	9	8	14.81
South	13	11	20.37
Total	62	54	100.00

Table 1 shows the proportional allocation of English teachers defined by the High School Districts in Ilagan City, Isabela. It revealed that majority came from West District with 35.20%, followed by South District with 20.37%. There were at most 8 English teachers from Northwest, San Antonio, and North Districts. With these results, there are 54 English teachers who were selected randomly to participate in this study.

In addition to the participating teachers, a sample of their students were also included in the study. For each teacher, grades were collected from a random selection of 15% of their students whose academic performance were considered for analysis. There was a total of 300 students whose grades were considered for analysis.

Finally, the school heads participated as reviewers by validating the teachers' TPACK level using the same research instrument (questionnaire) completed by the teacher-respondents.

Research Locale

The study was conducted at the Schools Division of the City of Ilagan. The SDO-City of Ilagan was established on December 17, 2012. Currently, the SDO City of Ilagan is composed of 99 public schools where 17 of which are secondary schools found in five school districts namely: West, Northwest, San Antonio, North and South.

Research Instrument

The study used an adopted survey questionnaire which was developed by Shafie et al. (2022) in their study *Developing a 21st Century Technological Pedagogical Content Knowledge (TPACK) Instrument: Content Validity and Reliability*.

The first section of the questionnaire collected the profile of the respondents which, consisted of years of service and highest educational attainment. The second section of the questionnaire was the actual survey, which collected the respondents' knowledge level on the following seven components of the TPACK framework: TK, CK, PK, TPK, TCK, PCK, and TPACK. The questionnaire has 34 indicators which can be rated using a four-point Likert scale ranging from 4= Very High, 3 = High, 2= Low, and 1= Very Low.

Descriptive Values for the Interpretation for the Weighted Mean			
Perceived Level of Teachers' Knowledge		Academic Performance	
Range	Verbal Interpretation	Range	Verbal Interpretation
1.00-1.49	Strongly Disagree	below 75%	Did not meet expectations
1.50-2.49	Disagree	75-79%	Fairly Satisfactory
2.50-3.49	Fairly Agree	80-84%	Satisfactory

3.50-4.49	Agree	85-89%	Very Satisfactory
4.50-5.00	Strongly Agree	90-100%	Outstanding

Data Gathering Procedure

The researcher secured a request letter addressed to the Schools Division Superintendent of the City of Ilagan to conduct the study in this locale. After getting the approval, the researcher administered the questionnaires during the free time of the teachers to avoid interruption of classes. The researcher then gave a short orientation on the nature of the study and to reiterate the confidentiality of the data to be collected. Finally, the questionnaires were retrieved, and the researcher requested a copy of the sample students' GWA from their respective school registrars. An online survey questionnaire was also sent to the respondents.

Statistical Treatment of Data

The researcher utilized statistical software and Excel spread sheets to tabulate and analyze the collected data from the respondents. Frequencies, percentages and means were used to describe the academic performance of ESL learners, profile of teachers, and perceived level of knowledge in terms of technological, pedagogical, content, technological pedagogical, technological content, and technological pedagogical and content. Additionally, F-test was used to measure the difference in the perceived level of teachers' TPACK when they were grouped according to their profile, and Pearson *r* for relationship.

Results and Discussion:

Table 3. Profile of the Respondents.

Profile	Frequency (n=54)	Percent (100.0)
Years of Teaching Experience		
0-3	8	14.8
4-6	22	40.7
7-9	9	16.7
10 and above	15	27.8
Highest Educational Attainment		
Bachelor's Degree	33	61.1
Master's Degree	19	35.2
Doctorate Degree	2	3.7

Table 3 presents the profile of the respondents in terms of their years of experience and highest educational attainment. Interestingly, the findings reveal that a significant proportion of the sample have at least four years of teaching experience where majority of the 54 respondents falls within the 4–6-year teaching experience range, numbering to 22 or 40.7% of the total number of respondents, followed by 15 (27.8%) teachers whose teaching experience is ten and above years, and nine out of 54 respondents or (16.7%) have been teaching for 7-9 years. Conversely, the data suggests a smaller proportion of educators with less than four years of experience encompassing 14.8%. This distribution highlights the current trend of the ESL teaching workforce in the locale of the study, with a growing base of experienced educators alongside a continuous entry of new teachers.

In terms of highest educational attainment, it was revealed that majority of the respondents hold a bachelor’s degree numbering to 33 or 61.1%. This suggests that within this sample, it is the basic qualification for entering the teaching profession. Also, the presence of 19 or 35.2% of the respondents who finished their master’s degree indicates that some educators pursue their graduate studies, possibly to enhance their knowledge and skills. However, the limited number of respondents (3.7%) who pursued their doctorate degrees signifies that pursuing doctoral degrees may not be as essential in this group of educators. Overall, the respondents met the basic qualifications to teach.

Table 4. Academic Performance of the ESL Students of the Teacher-Respondents.		
Indicator	Frequency	Percentage
Outstanding (90-100)	99	33.00
Strongly Satisfactory (85-89)	85	28.33
Satisfactory (80-84)	80	26.67
Fairly Satisfactory (75-79)	36	12.00
Total	300	100.00
<i>Mean=86.26 (Very Satisfactory)</i>		

Table 4 shows the academic performance of the ESL students. It can be gleaned on the table that the overall mean of 86.26 or “Very Satisfactory” which implies that all the respondents showcased a performance that qualified them to succeed in their English subjects. Also, it was revealed that the majority the respondents had a very satisfactory academic performance, followed by satisfactory academic performance. It is worth noting that 99 respondents (33.00%) obtained an outstanding academic performance and 36 of them (12.00%) were within the range of fairly satisfactory. Using the grading system of the Department of Education, it can be inferred from the data that the performance of most of the respondents met the academic standards to pass their subjects.

Table 5. Level of Teachers' Technological, Pedagogical, Content, and Pedagogical Content Knowledge.

Items	Mean	Descriptive Equivalent
TECHNOLOGICAL KNOWLEDGE (TK)		
I can solve ICT related problems.	3.01	High
I am familiar with new technologies and their features.	2.92	High
I keep up with important new technologies.	3.01	High
I have the technical skills I need to use technology.	3.03	High
I know about a lot of different technologies.	2.85	High
Weighted Mean	2.94	High
CONTENT KNOWLEDGE (CK)		
I have sufficient knowledge in developing contents in English language subject.	3.27	High
I know the basic theories and concepts of English language subject.	3.31	High
I know the history and development of important theories in English language subject.	3.20	High
I am familiar with recent research in English language subject.	3.00	High
I have various ways and strategies of developing my understanding of English language subject.	3.31	High
Weighted Mean	3.21	High
PEDAGOGICAL KNOWLEDGE (PK)		
I know how to assess students' performance in a classroom.	3.50	Very High
I can adapt my teaching style to different learners.	3.46	High
I can assess students' learning in multiple ways.	3.51	Very High
I can use a wide range of teaching approaches in classroom setting.	3.44	High
I know how to organize and maintain classroom management.	3.48	High
Weighted Mean	3.47	High
Pedagogical Content Knowledge (PCK)		
In teaching English language subject, I know how to guide students to communicate with each other.	3.40	High

In teaching English language subject, I know how to guide students' critical thinking.	3.42	High
In teaching English language subject, I know how to guide students to collaborate with each other in group work.	3.44	High
In teaching English language subject, I know how to guide students' creative thinking.	3.42	High
In teaching English language subject, I know how to guide students in learning values and ethics.	3.46	High
Weighted Mean	3.42	High
Grand Mean	3.26	High

Legend: 2.50-3.49 = High; 3.50-4.00 = Very High

Presented in Table 5 is the level of Teachers' TK, CK, PK, and PCK with a grand mean of 3.26 or "High". All the statements under TK were rated as "High" with a weighted mean of 2.94. As shown in table 5, among the indicators under the Technological Knowledge (TK), the highest mean of 3.03 or "High" implies that the respondents believe that they have the skills they need to use technology. However, having the statement "I know a lot of different technologies" obtaining the lowest mean of 2.85 among all other statements in the survey implies that despite being rated as "High", there is still a need to update on the ESL teachers' awareness on different technologies. These findings is supported by the study of Cloete (2017) which also claims that having high level of TK is significantly vital in surviving the digital world.

The respondents of this study also reported a positive response on CK in the English language with an overall mean of 3.21 or "High." This reveals that the respondents have "High" level of knowledge in all the indicators under the CK. Specifically, the highest mean 3.31 implies that the respondents have sufficient knowledge in various ways and strategies of developing their understanding of English language subject. This finding conforms with the conclusions of Ball et al. (2008) in their article which stated that teachers must have sufficient knowledge about the subject they teach, emphasizing that educators who do not themselves have the sufficient knowledge about the content they teach are not likely to have the ability to help the learners learn this content. In PK, the respondents exhibited a high level of understanding on how to manage their classes with an overall mean score of 3.47. Moreover, the highest mean rating of 3.51 falling between "Very High" show the respondents' confidence in assessing students' performance in their classrooms, adapting variety of instructional styles to cater diverse students' needs, employing wide variety of teaching methods, and maintaining an organized and effective classroom management. This stresses the respondents' high level of understanding of the core principles of effective pedagogy, which are essential in fostering a positive and productive learning environment since developing good pedagogical practices strengthens students' critical thinking which enables them to evaluate information effectively (Mahdi et al., 2020).

Meanwhile, the results of the study also reveal a strong consensus among the participating ESL teachers on their PCK having obtained an overall mean of 3.42, which implies that the teachers expressed a high level of assessment in their ability to guide their students' development in various aspects of English language learning. The highest mean on this dimension is 3.46 which falls under the “High” category of the descriptive scale. However, statement 16 obtaining the lowest mean score of 3.42 under PCK indicates that there is still a need to strengthen ESL teachers’ knowledge on how to assist learners in communicating with each other. Shulman (1987) describes PCK as: ... the capacity of a teacher to transform the content knowledge he or she possesses into forms that are pedagogically powerful and yet adaptive to the variations in ability and background presented by the students. (p. 15). Hence, it can be inferred that it is imperative for educators to have a high level of pedagogical knowledge to effectively transfer the content to the learners.

Table 6. Level of Teachers’ Technological Pedagogical, Technological Content, and Technological Pedagogical Content Knowledge.		
Items	Mean	Descriptive Equivalent
Technological Pedagogical Knowledge (TPK)		
I know how to use ICT in teaching as a tool to stimulate students’ critical thinking	3.33	High
I know how to use ICT in teaching as a tool to stimulate students’ creative thinking.	3.35	High
I know how to use ICT in teaching as a tool for students to collaborate with each other.	3.33	High
I know how to use ICT in teaching as a tool for students to communicate.	3.33	High
I know how to use ICT in teaching as a tool to teach values and ethics to students.	3.35	High
Weighted Mean	3.33	High
Technological Content knowledge (TCK)		
I know websites with online materials for teaching English language subjects and 21 st century skills.	3.11	High
I know ICT-applications which are used by professionals in teaching English language subjects and 21 st century skills.	3.14	High
I know ICT applications which I can use to better understand the contents of English language subjects and 21 st century skills.	3.12	High
I know which technologies I can use to illustrate difficult contents in teaching English language subjects and 21 st century skills.	3.05	High
Weighted Mean	3.10	High
Technological Pedagogical Content Knowledge (TPACK)		
		High

I can teach lessons that appropriately combine English language, technologies, 21 st century skills, and teaching approaches.	3.31	High
I can select technologies to enhance what I teach, how I teach, and what students learn in English language class.	3.27	High
I can use strategies that combine content, technologies, 21 st century skills, and teaching approaches in English language class.	3.31	High
I can provide leadership in helping others to coordinate the use of content, technologies, 21 st century skills, and teaching approaches at my school.	3.16	High
I can choose technologies that enhance the content for English language lesson and 21 st century skills.	3.22	High
Weighted Mean	3.25	High
Grand Mean	3.23	High
<i>Legend: 2.50-3.49 = Agree; 3.50-4.00 = Strongly Agree</i>		

Table 6 presents the level of teachers' TPK, TCK, and TPACK. The grand mean, 3.23 suggests that the respondents have a high level of knowledge on these dimensions.

In terms of TPK, the respondents gave an overall mean of 3.33 or “High,” which shows that the respondents are confident in using ICT in teaching. The highest mean of 3.35 or “High” implies that the respondents have high level of knowledge in terms of using ICT as a tool to stimulate their creative thinking skills and in teaching values and ethics. The recent study of Aldisa (2024) supported the idea that learning nowadays must be aided with technology as it has a significant positive influence in the learning process and student’s daily lives. Also, this finding conforms with a recent study which concluded that one of the main focuses of the TPACK framework is the usage of technology in instruction and it is very vital for teachers to possess high level of knowledge in technology integration (Yildirim and Kocak, 2016). And as discussed by Adipat (2021), strategically integrating technology, suitable teaching techniques, and instructional practices can foster the creation of authentic, engaging, and collaborative learning environments, which gives the learners the opportunity to improve their learning and develop new skills that can be used to surmount the ever-changing world.

The table also reveals the TCK of the teacher-respondents presenting an overall mean score of 3.10 or “High.” Conversely, the study of Kassem (2018) recommended that teachers should have a clear understanding that the main purpose of technology in the teaching-learning process is to add value to the learning environment and not to distract the learners’ interest to learn. Hence, it is important to note that technology, content and pedagogy must be integrated in a balanced manner. The highest mean of 3.14 suggests that ESL teachers agree that they know ICT-applications used by professionals in teaching English language subjects and 21st Century skills.

Finally, having an overall mean of 3.25 in TPACK, the results of this study indicate that teachers generally reported a high level of assessment in their ability to integrate technology into their lessons. Obtaining the highest mean of 3.31 propose that teachers feel comfortable in integrating the English language skills, various technologies, and 21st-century skills into their teaching approaches and methodologies. Conversely, the data also reveals a possible area for improvement specifically in providing leadership in helping others integrate TPACK concept. The lowest mean of 3.16 on this dimension suggests that while the respondents may feel positive in their own TPACK skills, they might be less confident in helping and supporting their colleagues in developing their TPACK.

These findings align with previous research that highlights the importance of fostering collaborative learning environments for teachers to share and develop their TPACK knowledge (Chang et al., 2018). Further investigation into the specific aspects of TPACK leadership that teachers feel less confident in could inform professional development initiatives aimed at strengthening their ability to support their colleagues.

Table 7. Difference in the Level of Teachers’ Technological, Pedagogical, and Content Knowledge when the Respondents are Grouped according to their Years of Teaching Experience.

Items	0-3		4-6		7-9		10 and above		F-values	p-values
	Mean	DE	Mean	DE	Mean	DE	Mean	DE		
TECHNOLOGICAL KNOWLEDGE (TK)										
I can solve ICT related problems.	3.12	H	3.36	H	3.00	H	2.46	L	6.86*	0.00
I am familiar with new technologies and their features.	3.00	H	3.36	H	2.77	H	2.33	L	9.01*	0.00
I keep up with important new technologies.	3.25	H	3.40	H	2.77	H	2.46	L	6.69*	0.00
I have the technical skills I need to use technology.	3.12	H	3.40	H	3.11	H	2.40	L	8.25*	0.00
I know about a lot of different technologies.	3.00	H	3.22	H	2.77	H	2.26	L	7.69*	0.00
CONTENT KNOWLEDGE (CK)										

I have sufficient knowledge in developing contents in English language subject.	3.12	H	3.36	H	3.33	H	3.20	H	.48 ^{ns}	0.70
I know the basic theories and concepts of English language subject.	3.25	H	3.40	H	3.33	H	3.20	H	.47 ^{ns}	0.70
I know the history and development of important theories in English language subject.	3.00	H	3.27	H	3.33	H	3.13	H	.61 ^{ns}	0.61
I am familiar with recent research in English language subject.	2.75	H	3.04	H	3.11	H	3.00	H	.71 ^{ns}	0.55
I have various ways and strategies of developing my understanding of English language subject.	3.37	H	3.36	H	3.22	H	3.26	H	.24 ^{ns}	0.87
PEDAGOGICAL KNOWLEDGE (PK)										
I know how to assess students' performance in a classroom.	3.62	VH	3.63	VH	3.33	H	3.33	H	4.63 ^{ns}	0.20
I can adapt my teaching style to different learners.	3.62	VH	3.54	VH	3.33	H	3.33	H	1.00 ^{ns}	0.40
I can assess students' learning in multiple ways.	3.62	VH	3.68	VH	3.44	H	3.26	H	2.37 ^{ns}	0.08
I can use a wide range of teaching approaches in classroom setting.	3.50	VH	3.59	VH	3.33	H	3.26	H	1.27 ^{ns}	0.30
I know how to organize and maintain classroom management.	3.62	VH	3.63	VH	3.33	H	3.26	H	1.90 ^{ns}	0.14
<i>Legend: 1.50-2.49 = Low (L); 2.50-3.49 = High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level</i>										

Table 7 shows the difference in the level of teachers' TK, CK, and PK when they are grouped according to their number of years in teaching. In terms of teachers' technological knowledge (TK), 0 to 9 years in the service obtained mean ratings from 2.77 to 3.40 or described as "High." These results imply that they solved ICT related problems, and familiar with using new technologies and their functions. They applied different technologies in the subject matter, had technical skills to use technology, and use of updated technologies. On the other hand, teachers with 10 years and above in the teaching profession gave the lowest mean rating from 2.26 to 2.46 or "Low" indicating that they have the least level of knowledge in using technology. The F values from 6.86 to 9.01 with significance level of 0.00 led to the rejection of the null hypothesis indicating that teachers' number of years in the service was significantly different in their technological competence. Hence, teachers with 10 years and above in the teaching profession most likely obtained the lowest technological competence, while teachers with 0-9 years obtained higher level of TK. This finding contradicts the conclusion of a recent study conducted by Qadikolaei et al. (2024) that there is no significant difference in the technological knowledge scores between the more experienced and less experienced EFL/ESL teachers. However, a recent study conducted by Abubakir et al. (2023) supports the findings of this study highlighting the impact of years of experience on teachers' knowledge and practice specifically in their TK where teachers with 1–5 years of experience demonstrated higher TK than teachers with more years of teaching.

Considering the findings of this study, it is possible that teachers with higher years of experience are less likely to adapt to the new technologies than younger teachers, who are referred to as digital natives.

In terms of content knowledge (CK), the F values from 0.240 to 0.61 with significant levels from 0.55 to 0.87 which are greater than 0.05, therefore, the null hypothesis stating that there is no significant difference in the teachers' content knowledge according to their number of years in the service is accepted. Furthermore, they obtained mean ratings from 2.75 to 3.33 or described as "high" implying that the teachers had the comparable agreement on content knowledge regardless of their number of years in the service.

In terms of pedagogical knowledge (PK), the teachers with 0 to 6 years in teaching gave higher mean ratings from 3.50 to 3.68 or "Very High" indicating that they assessed their students using different assessment strategies, utilization of different teaching approaches to cater diverse learners, and obtained organized and maintained classroom management. On the other hand, the teachers with 7 years and above gave lower mean ratings from 3.26 to 3.44 or "High." Hence, the teachers showed similar level on their pedagogical knowledge with F values from 1.00 to 4.63 with significant levels from 0.08-0.40 which are greater than 0.05 therefore accepting the null hypothesis stating that there is no significant difference in the teachers' pedagogical knowledge according to their number of years in the service. This was specifically pointed out in the study conducted by Scherer (2023) opposing the assumption that "the more experienced, the better prepared in teaching."

Table 8. Difference in the Level of Teachers' Pedagogical Content Knowledge, Technological Pedagogical Knowledge, and Technological Content Knowledge when they are Grouped according to their Years of Teaching Experience.

Items	0-3		4-6		7-9		10 and above		F-value	P-value
	Mean	DE	Mean	DE	Mean	DE	Mean	DE		
Pedagogical Content Knowledge (PCK)										

In teaching English language subject, I know how to guide students to communicate with each other.	3.50	VH	3.40	H	3.44	H	3.33	H	0.21 ^{ns}	0.88
In teaching English language subject, I know how to guide students' critical thinking.	3.50	VH	3.45	H	3.44	H	3.33	H	0.25 ^{ns}	0.86
In teaching English language subject, I know how to guide students to collaborate with each other in group work.	3.62	VH	3.45	H	3.44	H	3.33	H	0.58 ^{ns}	0.63
In teaching English language subject, I know how to guide students' creative thinking.	3.62	VH	3.40	H	3.44	H	3.33	H	0.60 ^{ns}	0.62
In teaching English language subject, I know how to guide students in learning values and ethics.	3.62	VH	3.50	VH	3.44	H	3.33	H	0.64 ^{ns}	0.59
Technological Pedagogical Knowledge (TPK)										
I know how to use ICT in teaching as a tool to stimulate students' critical thinking	3.62	VH	3.45	H	3.22	H	3.06	H	3.08*	0.04
I know how to use ICT in teaching as a tool to stimulate students' creative thinking.	3.62	VH	3.45	H	3.22	H	3.13	H	2.24 ^{ns}	0.10

I know how to use ICT in teaching as a tool for students to collaborate with each other.	3.50	VH	3.50	VH	3.11	H	3.13	H	2.58 ^{ns}	0.06
I know how to use ICT in teaching as a tool for students to communicate.	3.62	VH	3.40	H	3.11	H	3.20	H	2.03 ^{ns}	0.12
I know how to use ICT in teaching as a tool to teach values and ethics to students.	3.62	VH	3.45	H	3.11	H	3.20	H	2.24 ^{ns}	0.10
Technological Content knowledge (TCK)										
I know websites with online materials for teaching English language subjects and 21 st century skills.	3.25	H	3.22	H	3	H	2.93	H	1.21 ^{ns}	0.32
I know ICT-applications which are used by professionals in teaching English language subjects and 21 st century skills.	3.12	H	3.31	H	3.11	H	2.93	H	1.15 ^{ns}	0.34
I know ICT applications which I can use to better understand the contents of English language subjects and 21 st century skills.	3.12	H	3.27	H	3.11	H	2.93	H	0.82 ^{ns}	0.49
I know which technologies I can use to illustrate difficult contents in teaching English language	3.12	H	3.13	H	3.11	H	2.86	H	0.62 ^{ns}	0.61

subjects and 21 st century skills.										
<i>Legend: 1.50-2.49 = Low (L); 2.50-3.49 = High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level</i>										

Table 8 presents the difference in the level of teachers’ PCK, TPK, and TCK when they are grouped according to their years of teaching experience.

In terms of PCK, teachers with 0 to 3 years in teaching gave mean rating from 3.50 to 3.62 or described as “High.” These results imply that teachers with 0 to 3 years in the service had strong agreement to conduct collaborative task, guide students to communicate with each other, enhancing their critical thinking, creative thinking, and learning values and ethics. On the other hand, the teachers with 7 years and above in the teaching gave mean ratings from 3.33 to 3.44 or described as “High.” The teachers with 4 to 6 years in the teaching profession had the same level of agreement as teachers with 7 years and above in the teaching except for one indicator implying that they strongly agreed to guide their students to enhance their learning with values and ethics. In PCK, teachers with 0-3 years of teaching experience gave the highest mean, while those with 10 and above years of teaching experience obtained the lowest. The results had F values from 0.21 to 0.64 with significance levels from 0.62 to 0.88 which are greater than 0.05. Therefore, the null hypothesis stating that there is no significant difference in the teachers’ pedagogical content knowledge according to their number of years in the teaching is accepted. Hence, the teachers had similar level of pedagogical content knowledge regardless of their teaching experience.

In terms TPK, the teachers with teaching experience from 0 to 3 years gave mean ratings from 3.50 to 3.62 or “Very high.” The results indicate that they applied ICT in their teaching as a tool to stimulate students’ critical thinking, creative thinking, and communicate students. Furthermore, teachers used ICT to conduct collaborative tasks, and teaching values and ethics. Moreover, the teachers with 4 to 6 years in teaching had the same level of assessment as 7 and above years in the teaching profession except for one indicator indicating the use of ICT to conduct collaborative activities for teaching English subjects, where teachers with 4 to 6 years of experience obtained higher mean score than those with 7 and above years of teaching experience. The F value of 3.08 with significance level of 0.04 or less than 0.05 led to the rejection of the null hypothesis implying that teachers had significantly different level of knowledge in the utilization of ICT to enhance students’ critical thinking. Hence, the teachers with teaching experience from 10 years and above gave significantly lowest mean rating indicating that they were most likely had the lowest technological pedagogical knowledge to use ICT for enhancing students’ critical thinking. On the other hand, the F values from 2.03 to 2.58 with significance levels greater from 0.04 to 0.12 greater than 0.05 led to the acceptance of the null hypothesis implying that teachers had comparable competence on using technologies and strategies in teaching English subjects.

In terms of TCK, the teachers gave mean ratings from 2.86 to 3.25 or described as “High” indicating that they had comparable agreements on their competency in utilizing technology aligned to their content or subject matter regardless of their teaching experiences. These were based on the F values from 0.62 to 1.21 with significance levels greater than 0.05 led to accept the null hypothesis stating that there is no significant difference in teachers’ technological content knowledge according to their teaching experience.

The findings above in terms of the respondents' level of PK, PCK, and TPK oppose the claim of Qadikolaei et. al (2024) that the more experienced teachers outperform the less experienced ones in terms of the mentioned areas of TPACK

Table 9. Difference in the Level of Teachers' Technological, Pedagogical, and Content Knowledge when they are Grouped according to their Years of Teaching Experience.										
Items	0-3		4-6		7-9	10 and above			F-value	P-value
	Mean	DE	Mean	DE	Mean	DE	Mean	DE		
Technological Pedagogical Content Knowledge (TPACK)										
I can teach lessons that appropriately combine English language, technologies, 21 st century skills, and teaching approaches.	3.50	VH	3.45	H	3.22	H	3.06	H	1.73 ^{ns}	0.16
I can select technologies to enhance what I teach, how I teach, and what students learn in English language class.	3.62	VH	3.36	H	3.11	H	3.06	H	2.67 ^{ns}	0.06
I can use strategies that combine content, technologies, 21 st century skills, and teaching approaches in English language class.	3.62	VH	3.31	H	3.22	H	3.20	H	0.94 ^{ns}	0.43
I can provide leadership in helping others to coordinate the use of content, technologies, 21 st century skills, and teaching approaches at my school.	3.37	H	3.18	H	3.11	H	3.06	H	0.59 ^{ns}	0.62
I can choose technologies that enhance the content for English language	3.50	VH	3.22	H	3.11	H	3.13	H	0.98 ^{ns}	0.41

lesson and 21 st century skills.										
Legend: 1.50-2.49 =Low (L); 2.50-3.49 =High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level										

Table 9 presents that in terms of technological content knowledge of teachers, teaching experience with 4 years and above gave mean ratings from 3.06 to 3.45 or described as “High” indicating that they combined English language, technologies, 21st century skills and teaching approaches. The teachers with teaching experience from 0 to 3 years gave the highest mean ratings from 3.50 to 3.62 or “Very High”, while those with 10 and above years of experience obtained the lowest mean. The teachers show comparable level of TPACK in teaching English subjects regardless of their teaching experiences with F values from 0.59 to 2.67 with significance levels greater than 0.05. Therefore, the null hypothesis is accepted.

Interestingly, the findings of this study in one of the sub-components of TPACK which is TK reveal that teachers with 10 and above years teaching experience obtained an overall mean of 2.38 or “Low” which is lower than those with 0-3 years of teaching experience with an overall mean of 3.10. This is supported by the study of Jang et al. (2013) which found that educators with higher teaching experience have a lower level of TK than those who are new in the teaching profession. One possible interpretation for this finding is that novice teachers are typically younger who just started their teaching careers and are more exposed to the different technologies nowadays. In contrast, experienced teachers tend to be older who are more confident in using traditional teaching strategies than integrating new technologies in their teaching practices. With this assumption, it can be said that new teachers are more knowledgeable in integrating technology in the teaching-learning process (Zhakiyanova et al., 2023).

Moreover, in 2019, Nazari et al. evaluated novice and experienced EFL teachers perceived TPACK for their professional development and found that novice teachers are more proficient in their TK, TCK, and TPK and less proficient their PCK, while the experienced teachers showed higher proficiency in PK, and PCK. This indicates that younger teachers are more likely to possess higher technological knowledge since experienced teachers are considered digital immigrants (Ji et al., 2020).

Overall, the study found no significant differences in all other sub-domains which aligns with recent studies that have reported inconclusive findings on the differences of teachers’ TPACK when grouped according to their years of experience. The study of Driel et al. 1998 as cited by Mansour et al. (2024) argued that experience in teaching is the fundamental source of PCK. Studies by Chai et al. (2011) and Ertmer et al. (2012) have shown weak or inconsistent inferences between TPACK scores and years of teaching experience.

Table 10. Difference in the Level of Teachers’ Technological, and Pedagogical, Knowledge when they are Grouped according to their Highest Educational Attainment								
Items	Bachelor’s Degree		Master’s Degree		Doctorate Degree		F-value	P-value
	Mean	DE	Mean	DE	Mean	DE		
TECHNOLOGICAL KNOWLEDGE (TK)								

I can solve ICT related problems.	2.93	H	3.10	H	3.50	VH	0.86 ^{ns}	0.43
I am familiar with new technologies and their features.	2.75	H	3.15	H	3.50	VH	2.66 ^{ns}	0.08
I keep up with important new technologies.	2.93	H	3.10	H	3.50	VH	0.69 ^{ns}	0.50
I have the technical skills I need to use technology.	2.90	H	3.21	H	3.50	VH	1.50 ^{ns}	0.24
I know about a lot of different technologies.	2.78	H	2.89	H	3.50	VH	1.00 ^{ns}	0.38
CONTENT KNOWLEDGE (CK)								
I have sufficient knowledge in developing contents in English language subject.	3.15	H	3.42	H	4.00	VH	3.36*	0.04
I know the basic theories and concepts of English language subject.	3.18	H	3.47	H	4.00	VH	3.74*	0.03
I know the history and development of important theories in English language subject.	3.00	H	3.47	H	4.00	VH	6.96*	0.00
I am familiar with recent research in English language subject.	2.87	H	3.10	H	4.00	VH	5.17*	0.01
I have various ways and strategies of developing my understanding of English language subject.	3.18	H	3.47	H	4.00	VH	4.38*	0.02
<i>Legend: 2.50-3.49 = High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level</i>								

Table 10 shows the difference in the teachers' evaluation on technological, pedagogical, and content knowledge according to their highest educational attainment.

In terms of the TK, teachers with doctorate degree gave the highest mean ratings of 3.50 or described as "Very High" indicating that they have very high-level knowledge in terms of solving their problems using ICT, updating themselves with new technologies, and function, and technical skills in using different technologies. On the other hand, bachelor's degree and master's degree gave mean ratings from 2.75 to 3.21 or "High." Therefore, regardless of their highest educational attainment, teachers demonstrate comparable levels of agreement about their technological knowledge, as indicated by the F values, which range from 0.69 to 2.66

with significance levels greater than 0.05. Therefore, the null hypothesis is accepted. However, the study of Foulger et al. (2017) shed light on how the teachers’ ability to integrate technology in their classes differs according to their educational backgrounds.

In terms of content knowledge, teachers with doctorate degrees received the highest mean rating of 4.00, or "Very high" This indicates that they possess sufficient knowledge to develop their English subjects, understand basic theories and concepts, comprehend the history and development of important theories, are familiar with recent research, and employ various strategies to enhance students' understanding of English subjects. On the other hand, teachers with bachelor’s and finished master’s degrees gave mean ratings from 2.87 to 3.47, or “agree.” The F values, which ranged from 3.36 to 6.96 at significance levels 0.00 to 0.04 which are less than 0.05, showed that the teachers with a doctorate knew more about the content of the English subject than those with a bachelor's or master's degree. This meant that the null hypothesis is not accepted. This finding agrees with the study of Yildirim and Kocak (2016) which found that teachers with higher educational attainment or postgraduate degrees tended to score higher on TPACK assessments than those with lower degrees. However, this negates the findings of Qadikolaei (2024) in his study stating that EFL teachers have the same assessment about their level of TK, PK, CK, PCK, TPK, and TPACK regardless of their educational attainment.

Table 11. Difference in the Level of Teachers’ Pedagogical, and Pedagogical Content Knowledge when they are Grouped according to their Highest Educational Attainment.

Items	Bachelor’s Degree		Master’s Degree		Doctorate Degree		F-value	p-value
	Mean	DE	Mean	DE	Mean	DE		
PEDAGOGICAL KNOWLEDGE (PK)								
I know how to assess students’ performance in a classroom.	3.39	H	3.63	VH	4.00	VH	2.49 ^{ns}	0.09
I can adapt my teaching style to different learners.	3.33	H	3.63	VH	4.00	VH	3.63*	0.03
I can assess students’ learning in multiple ways.	3.45	H	3.57	VH	4.00	VH	1.33 ^{ns}	0.27
I can use a wide range of teaching approaches in classroom setting.	3.33	H	3.57	VH	4.00	VH	2.50 ^{ns}	0.09
I know how to organize and maintain classroom management.	3.36	H	3.63	VH	4.00	VH	2.58 ^{ns}	0.09
Pedagogical Content Knowledge (PCK)								

In teaching English language subject, I know how to guide students to communicate with each other.	3.39	H	3.36	H	4.00	VH	1.53 ^{ns}	0.23
In teaching English language subject, I know how to guide students' critical thinking.	3.36	H	3.47	H	4.00	VH	1.71 ^{ns}	0.19
In teaching English language subject, I know how to guide students to collaborate with each other in group work.	3.42	H	3.42	H	4.00	VH	1.29 ^{ns}	0.29
In teaching English language subject, I know how to guide students' creative thinking.	3.42	H	3.36	H	4.00	VH	1.48 ^{ns}	0.24
In teaching English language subject, I know how to guide students in learning values and ethics.	3.39	H	3.52	VH	4.00	VH	1.64 ^{ns}	0.20
<i>Legend: 2.50-3.49 = High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level</i>								

Table 11 presents the difference in the level of the respondents' PK and PCK when they are grouped according to their highest educational attainment.

In terms of PK, the teachers with doctorate degrees gave highest mean ratings of 4.00, or "Very High," in comparison to those with bachelor's degree who obtained the lowest mean among them. This implies that teachers with doctorate had a higher level of pedagogical competence in adapting their teaching styles to cater diverse learners compared to those with bachelor's and master's degrees. Meanwhile, those with bachelor's and master's degrees gave mean ratings from 3.33 to 3.63, or "High," indicating they had comparable level on their pedagogical knowledge in teaching English subjects. Furthermore, the F value of 3.63 with a significance level less than 0.05 suggests that teachers with doctorate degree are more adaptive in the different teaching styles to cater various kinds of learners compared to those who did not pursue their graduate studies. However, the F values range from 1.33 to 2.58, with significance levels greater than 0.05, indicating that teachers show similar levels of agreement about their competence in the pedagogical domain, regardless of their highest educational attainment therefore accepting the null hypothesis stating that there is no significant difference in the teachers' PK when they are grouped according to their highest educational attainment.

In terms of PCK, the teachers with doctorate degrees gave mean ratings of 4.00, or "Very High," implying that they guided their students to communicate with other students, enhanced the students' critical thinking and creative thinking, and taught values and ethics. Furthermore, they conducted collaborative tasks to work with other students in a classroom. On the other hand, teachers with bachelor's and master's degrees show the same level of agreement except for one indicator, which means that teachers who finished master's level strongly agreed that they guided their students to learn values and ethics in their English subjects. For this indicator, those with doctorate degree obtained the highest mean, while those with bachelor's degree gave the lowest. As a result, the F values ranging from 1.29 to 1.71 with significance levels greater than 0.05 led to the rejection of the null hypothesis, indicating that the teachers had a comparable level of PCK domain regardless of their highest educational attainmen

Table 12. Difference in the Level of Teachers' Technological Pedagogical, and Technological Content Knowledge when the they are Grouped according to their Highest Educational Attainment.

Items	Bachelor's Degree		Master's Degree		Doctorate Degree		F	p-value
	Mean	DE	Mean	DE	Mean	DE		
Technological Pedagogical Knowledge (TPK)								
I know how to use ICT in teaching as a tool to stimulate students' critical thinking	3.27	H	3.42	H	3.50	VH	0.60 ^{ns}	0.55
I know how to use ICT in teaching as a tool to stimulate students' creative thinking.	3.24	H	3.52	VH	3.50	VH	1.95 ^{ns}	0.15
I know how to use ICT in teaching as a tool for students to collaborate with each other.	3.27	H	3.42	H	3.50	VH	0.60 ^{ns}	0.55
I know how to use ICT in teaching as a tool for students to communicate.	3.24	H	3.42	H	4.00	VH	2.63 ^{ns}	0.08
I know how to use ICT in teaching as a tool to teach values and ethics to students.	3.24	H	3.47	H	4.00	VH	3.02 ^{ns}	0.06
Technological Content knowledge (TCK)								
I know websites with online materials for teaching English language subjects and 21 st century skills.	3.00	H	3.21	H	4.00	VH	4.23*	0.02
I know ICT-applications which are used by professionals in	3.03	H	3.26	H	4.00	VH	2.95 ^{ns}	0.06

teaching English language subjects and 21 st century skills.								
I know ICT applications which I can use to better understand the contents of English language subjects and 21 st century skills.	3.03	H	3.21	H	4.00	VH	2.49 ^{ns}	0.09
I know which technologies I can use to illustrate difficult contents in teaching English language subjects and 21 st century skills.	2.93	H	3.15	H	4.00	VH	3.36*	0.04
<p><i>Legend: 2.50-3.49 = High (H); 3.50-4.00 = Very High (VH); * = significant; ns = not significant at 0.05 level</i></p>								

In terms of TPK, the teachers with doctorate degrees gave mean the highest ratings from 3.50 to 4.00, or “Very High,” On the other hand, the teachers who finished bachelor’s degree obtained the lowest mean rating from 3.24 to 3.27.” The results show that the teachers had similar levels on their TPK domain no matter how much schooling they had. These were based on the F values ranging from 0.60 to 3.02, and the significance levels were greater than 0.05. Therefore, the null hypothesis is accepted stating that there is no significant difference in teachers' competence in the TPK domain based on their highest level of education.

In terms of technological content knowledge (TCK), the teachers with doctorate degrees gave the highest mean ratings of 4.00, or “Very High,” indicating that they used online materials in teaching English subjects and 21st century skills, used ICT applications to align with the subject matter, and integrated ICT to better understand the contents of English subjects and 21st century skills. On the other hand, the teachers with bachelor’s degree gave the lowest mean ratings from 2.93 to 3.03, or “High.” Hence, the teachers had comparable levels of agreement about their competence on the TCK domain, except for one indicator with an F value of 4.22 and a significance level less than 0.05. These results imply that teachers with doctorate degrees were more likely to utilize ICT to find online resources for teaching English language subjects and 21st century skills. These findings oppose the conclusion of Qadikolaei et al. (2024) in their study that teachers who obtained graduate degrees outperform those with bachelor’s degrees in terms of TCK

Table 13. Difference in the Level of Teachers' Technological, Pedagogical, and Content Knowledge when they are Grouped according to their Highest Educational Attainment

Items	Bachelor's Degree		Master's Degree		Doctorate Degree		F-value	p-value
	Mean	DE	Mean	DE	Mean	DE		
Technological Pedagogical Content Knowledge (TPACK)								
I can teach lessons that appropriately combine English language, technologies, 21 st century skills, and teaching approaches.	3.24	H	3.36	H	4.00	VH	1.81 ^{ns}	0.18
I can select technologies to enhance what I teach, how I teach, and what students learn in English language class.	3.18	H	3.36	H	4.00	VH	2.88 ^{ns}	0.07
I can use strategies that combine content, technologies, 21 st century skills, and teaching approaches in English language class.	3.18	H	3.47	H	4.00	VH	2.89 ^{ns}	0.07
I can provide leadership in helping others to coordinate the use of content, technologies, 21 st century skills, and teaching approaches at my school.	3.12	H	3.15	H	4.00	VH	2.65 ^{ns}	0.08
I can choose technologies that enhance the content for English language lesson and 21 st century skills.	3.18	H	3.21	H	4.00	VH	2.30 ^{ns}	0.11

*Legend: 2.50-3.49 = High (H); 3.50-4.00 = Strongly Agree (VH); * = significant; ns = not significant at 0.05 level*

In terms of technological pedagogical content knowledge, the teachers with doctorate degrees gave the highest mean ratings of 4.00, or “Very High,” implying that they conducted the lessons with an appropriate combination of English language, technologies, 21st century skills, and teaching approaches. Furthermore, they utilized technologies to enhance learners’ knowledge about their subject matter and used different strategies to combine approaches, content, and technologies to meet the demands of 21st century education. On the other hand, the teachers who finished their bachelor’s and master’s levels gave lower mean ratings from 3.18 to 3.47, or “High.” Hence, the teachers show comparable levels of agreement about the TPACK competence for teaching English subjects, with F values ranging from 1.805 to 2.893 and significance levels greater than 0.05.

The study of Li et al. (2022) found that the seven sub-domains of TPACK significantly differed according to teachers’ educational levels, where teachers with higher educational attainment has better TPACK abilities. However, in this study ESL teachers’ TPACK level significantly differed in one sub-domain which is CK. This implies that ESL teachers who obtained higher educational attainment are more likely to have a mastery of the subject matter and are more updated when it comes to the new trends in the English language subject.

Except for CK, the results of this study show that higher educational attainment does not convey a higher level of competence in other sub-domains of TPACK. This agrees with the findings of Nugroho et al. (2023) and Arifin (2017) which showed that obtaining high level of education does not guarantee a higher level of mastery in pedagogy and technology. Though in the study conducted by Harlina, Bachri and Dewi (2019), some teacher-respondents believed that they will only be able to achieve higher level of TPACK knowledge through further education, results of this study show that there is no significant difference in ESL teachers’ TPK which implies that the respondents of this study feels confident that they can still integrate technology and manage their classes effectively despite not having a doctorate degree.

Table 14. Relationship between the Students’ Academic Performance and Level of TPACK.			
	Items	Corr	Sig
TECHNOLOGICAL KNOWLEDGE (TK)			
I can solve ICT related problems.		-.20 ^{ns}	0.14
I am familiar with new technologies and their features.		-.22 ^{ns}	0.11
I keep up with important new technologies.		-.18 ^{ns}	0.20

I have the technical skills I need to use technology.	-.14 ^{ns}	0.33
I know about a lot of different technologies.	-.19 ^{ns}	0.16
CONTENT KNOWLEDGE (CK)		
I have sufficient knowledge in developing contents in English language subject.	-.12 ^{ns}	0.39
I know the basic theories and concepts of English language subject.	-.16 ^{ns}	0.25
I know the history and development of important theories in English language subject.	-.18 ^{ns}	0.20
I am familiar with recent research in English language subject.	-.11 ^{ns}	0.43
I have various ways and strategies of developing my understanding of English language subject.	-.12 ^{ns}	0.38
PEDAGOGICAL KNOWLEDGE (PK)		
I know how to assess students' performance in a classroom.	-.20 ^{ns}	0.14
I can adapt my teaching style to different learners.	-.16 ^{ns}	0.26
I can assess students' learning in multiple ways.	-.18 ^{ns}	0.19
I can use a wide range of teaching approaches in classroom setting.	-.19 ^{ns}	0.17

I know how to organize and maintain classroom management.	-.22 ^{ns}	0.11
Pedagogical Content Knowledge (PCK)		
In teaching English language subject, I know how to guide students to communicate with each other.	-.20 ^{ns}	0.15
In teaching English language subject, I know how to guide students' critical thinking.	-.19 ^{ns}	0.18
In teaching English language subject, I know how to guide students to collaborate with each other in group work.	-.15 ^{ns}	0.27
In teaching English language subject, I know how to guide students' creative thinking.	-.20 ^{ns}	0.14
In teaching English language subject, I know how to guide students in learning values and ethics.	-.21 ^{ns}	0.13
<i>Legend: * = significant; ns = not significant at 0.05 level</i>		

	Items	Corr	Sig
Technological Pedagogical Knowledge (TPK)			
	I know how to use ICT in teaching as a tool to stimulate students' critical thinking	-.24 ^{ns}	0.08
	I know how to use ICT in teaching as a tool to stimulate students' creative thinking.	-.17 ^{ns}	0.23
	I know how to use ICT in teaching as a tool for students to collaborate with each other.	-.28*	0.02

I know how to use ICT in teaching as a tool for students to communicate.	-.25 ^{ns}	0.07
I know how to use ICT in teaching as a tool to teach values and ethics to students.	-.27*	0.03
Technological Content knowledge (TCK)		
I know websites with online materials for teaching English language subjects and 21 st century skills.	-.19 ^{ns}	0.18
I know ICT-applications which are used by professionals in teaching English language subjects and 21 st century skills.	-.11 ^{ns}	0.43
I know ICT applications which I can use to better understand the contents of English language subjects and 21 st century skills.	-.14 ^{ns}	0.32
I know which technologies I can use to illustrate difficult contents in teaching English language subjects and 21 st century skills.	-.10 ^{ns}	0.46
Technological Pedagogical Content Knowledge (TPACK)		
I can teach lessons that appropriately combine English language, technologies, 21 st century skills, and teaching approaches.	-.20 ^{ns}	0.16
I can select technologies to enhance what I teach, how I teach, and what students learn in English language class.	-.14 ^{ns}	0.33
I can use strategies that combine content, technologies, 21 st century skills, and teaching approaches in English language class.	.03 ^{ns}	0.81
I can provide leadership in helping others to coordinate the use of content, technologies, 21 st century skills, and teaching approaches at my school.	-.20 ^{ns}	0.14
I can choose technologies that enhance the content for English language lesson and 21 st century skills.	-.10 ^{ns}	0.47
<i>Legend: * = significant; ns = not significant at 0.05 level</i>		

Table 14 presents the relationship between the students' academic achievement and teachers' level of TPACK domains.

For teachers' levels in TK, CK, PK, PCK, TCK, and TPACK, the correlation values ranged from -0.22 to 0.03, and significance levels greater than 0.05 meant that the null hypothesis was accepted. This means that there is no significant link between teachers' levels of competence in TK, CK, PK, PCK, TCK, and TPACK and students' academic performance. These results imply that the teachers' competence levels on the TK, CK, PK, PCK, TCK, and TPACK domains did not guarantee that the students obtained high academic performance in English subjects.

For technological pedagogical competence, correlation coefficients of -0.28 and -0.27 with significance levels less than 0.05 means that students with lower academic performance appreciates more their teachers who use

ICT to teach values and ethics and do group projects than those students with high academic performance. This disagrees with Keengwe and Georguna (2013) claim that integrating technology in education could meet the needs of the Millennial learners. Moreover, it also negates the conclusion that with the aid of a variety of technological tools, ESL students are given the freedom, inspiration, and support to be successful in their studies (Roy, 2019 and Fozila, 2023). These findings are also opposed by the study of Akturk and Ozturk (2019) with results implying that educators who know to utilize technology in the subject they teach positively influence the academic performance of their students.

The null hypothesis, on the other hand, was accepted because the correlation values were between -0.25 and -0.17 and the significance level was greater than 0.05. This meant that teachers who were good at other TPK indicators had no effect on how well their students did in school.

The result of this study negates the findings of Akturk and Ozturk (2019) that teachers with a high self-efficacy TPACK can effectively teach the subject which could increase the academic achievement of the learners. Moreover, these findings on the relationship of students' academic performance and teachers' level of TPACK oppose the conclusion of Shoukat et al., 2024 that level of TPACK of learners influence the learner's academic performance.

Conclusions:

Based on the findings of the study, the following conclusions were drawn:

1. The profile of the respondents reveals diverse data of teaching experience and highest educational attainment.
2. All the student-respondents showcased a performance that qualified them to succeed in the English language subject.
3. The respondents generally agreed with the indicators of TPACK. ESL teachers appeared to be very knowledgeable in all the sub-domains of TPACK.
4. Novice teachers outperformed the experienced ones in terms of TK, except for TK, there seemed to be no difference in all other sub-domains of TPACK when the respondents were grouped according to their number of years in teaching.
5. The highest educational attainment of the respondents has no significant difference on their level of TK and PK. While respondents with doctorate degrees reported a higher level of CK.
6. Students with lower academic performance has higher appreciation on the TPK of their teachers specifically in using ICT as a tool to teach collaboration, values and ethics than those with higher academic performance.

Based on the conclusion of the study, the following recommendations are provided:

1. Young ESL teachers are advised to enroll in their advanced education.
2. Educational institutions may continue hiring diversely qualified teachers since the variety in experience and educational attainment among the respondents suggested a powerful set of ESL teachers.
3. Strengthen Technological Pedagogical Content Knowledge (TPACK) for experienced teachers particularly on TK.
4. A professional development program may be conducted to capacitate senior teachers with the necessary skills they need to improve their knowledge and skills in the use of ICT.
5. Educators are encouraged to utilize technology strategically when teaching collaboration and ethics education, especially when dealing with low-performing students.

6. Future studies may be conducted to explore the reasons behind lower-performing ESL learners' better appreciation for ICT integration in their classrooms.

References:

1. Abdullah Z, Ghani M.F.A (2014). Professional Learning Community in Secondary Schools Community in Malaysia. *Journal of Education and Learning*. Vol.8 (3) pp. 227-248. Nurse Education Today
2. Abubakir, H., & Alshaboul, Y. (2023). Unravelling EFL teachers' mastery of TPACK: Technological pedagogical and content knowledge in writing classes. *Heliyon*, 9(6).
3. Adipat, S. (2021). Developing technological pedagogical content knowledge (TPACK) through technology-enhanced content and language-integrated learning (T-CLIL) Instruction. *Education and Information Technologies*, 26(5), 6461-6477.
4. Angeli, C. & Valanides, N. (2008). Epistemological and methodological issues for the conceptualization, development, and assessment of ICT–TPCK: Advances in technological pedagogical content knowledge (TPCK). *Computers & Education* 52, 154-168. doi:10.1016/j.compedu.2008.07.006
5. Aldisa, R. T. (2024). TECHNOLOGY TO IMPROVE THE QUALITY OF LIFE FOR STUDENTS AT THE DOMYADHU PEJATEN. *International Journal of Teaching and Learning*, 2(4), 978-981.
6. Akturk, A.O. & Saka Ozturk, H. (2019). Teachers' TPACK levels and students' self-efficacy as predictors of students' academic achievement. *International Journal of Research in Education and Science (IJRES)*, 5(1), 283-294.
7. Azhar, I. N. K., & Hashim, H. (2022). Level of ESL Teachers' Technological Pedagogical Content Knowledge (TPACK) Skill and Attitude towards Technology. *Creative Education*, 13, 1193- 1210. <https://doi.org/10.4236/ce.2022.134074>
8. Bulman, G. (2016). [*Handbook of the Economics of Education*] Volume 5 || *Technology and Education*. , (), 239–280. doi:10.1016/b978-0-444-63459-7.00005-1
9. Bugueño, W. M. R. (2013). *Using TPACK to promote effective language teaching in an ESL / EFL classroom*. University of Northern Iowa UNI ScholarWorks. UNIVERSITY OF NORTHERN IOWA. Retrieved from <https://scholarworks.uni.edu/grp/150>
10. Cloete, A.L., 2017, 'Technology and education: Challenges and opportunities', *HTS Teologiese Studies/ Theological Studies* 73(4), a4589. <https://doi.org/10.4102/hts.v73i4.4589>
11. Chai, C. S., Koh, J. H. L., Tsai, C., & Tan, L. (2011). Modelling primary school pre-service teachers' technological pedagogical content knowledge (TPACK) for meaningful learning with information and communication technology (ICT). *Computers & Education*, 57(1), 1184-1193. <https://doi.org/10.1016/j.compedu.2011.01.007>
12. Dadvand, B. and Behzadpoor, F. (2020) 'Pedagogical knowledge in English language teaching: A lifelong-learning, complex-system perspective'. *London Review of Education*, 18 (1): 107–125. <https://doi.org/10.18546/LRE.18.1.08>
13. Drajadi, N. A., Tan, L., Haryati, S., Rochsantiningsih, D., & Zainnuri, H. (2018). Investigating English language teachers in developing TPACK and multimodal literacy. In *Indonesian Journal of Applied Linguistics* (Vol. 7, Issue 3). <https://doi.org/10.17509/ijal.v7i3.9806>

14. Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers & Education*, 59(2), 423-435. <https://doi.org/10.1016/j.compedu.2012.02.001>
15. Filgona, Jacob & John, Sakiyo & Gwany, D. (2020). TEACHERS' PEDAGOGICAL CONTENT KNOWLEDGE AND STUDENTS' ACADEMIC ACHIEVEMENT: A THEORETICAL OVERVIEW. 14. 14-44.
16. Foulger, T. S., Graziano, K. J., Schmidt-Crawford, D. A., & Slykhuis, D. A. (2017). Technology integration in K-12 classrooms: Adoption, teachers' professional development, and content-specific uses. *Journal of Educational Computing Research*, 55(5), 671-681.
17. Nugroho, B. S., Tannady, H., Fuadi, T. M., Aina, M., & Anggreni, M. A. (2023). Role of Work Experience, Work Motivation and Educational Background on Teacher Performance at Vocational School. *Journal of Education and Entrepreneurship*, 11(2), 476-487.
18. Indriyono, H., Budiraharjo, M. & Bram, B. (2022) Assessing Vocational High School EFL Teachers' Technological Pedagogical Content Knowledge in Online Learning. *Journal of English Language and Pedagogy*. 5(20), 310-319.
19. Jason T. Abbitt (2011) Measuring Technological Pedagogical Content Knowledge in Preservice Teacher Education, *Journal of Research on Technology in Education*, 43:4, 281-300, DOI: 10.1080/15391523.2011.10782573
20. Ji, Hyangeun & Shin, Hye Won. (2020). Understanding of technological pedagogical content knowledge (TPACK) in South Korea: Does experience make a difference? *Multimedia-Assisted Language Learning*, 23(3), 45-67.
21. Jones, Monty & Debbagh, Mohammed. (2015). Using the TPACK Framework to Examine Technology Integration in English Language Teaching.
22. Kassem, M. A., (2018) Balancing Technology With Pedagogy In English Language Classroom: Teachers' Perspective. *International Journal of English Language Teaching*. 6(9), 1-19
23. Kapur, R. (2018). Pedagogical practices.
24. Keengwe, J. & Gergina, D., 2013, 'Supporting digital natives to learn effectively with technology tools', *International Journal of Information and Communication Technology Education* 9(1), 51–59. <https://doi.org/10.4018/jicte.2013010105>
25. [Koehler, M. J., & Mishra, P. \(2009\)](#). What is technological pedagogical content knowledge? *Contemporary Issues in Technology and Teacher Education*, 9(1), 60-70.
26. Koehler, M. J., Mishra, P., Kereluik, K., Shin, T. S., & Graham, C. R. (2014). The Technological Pedagogical Content Knowledge Framework. In J. M. Spector, M. D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of Research on Educational Communications and Technology* (4th ed., pp. 101-111). New York: Springer. https://doi.org/10.1007/978-1-4614-3185-5_9
27. König J, Lammerding S, Nold G, Rohde A. (2016) Teachers' professional knowledge for teaching English as a foreign language assessing the outcomes of teacher education. *Journal of Teacher Education*. 2016;67(4):320-337.
28. Korau YK. Pedagogical strategies for improving the teaching and learning of mathematics at the colleges of agriculture in Nigeria. *Journal of Studies in Science and Mathematics Education*. 2010;1(1):29-43.
29. Kurt, S. (2019). TPACK: Technological pedagogical content Knowledge Framework. <https://educationaltechnology.net/technological-pedagogical-content-knowledge-tpack-framework/>

30. Li, S.; Liu, Y.; Su, Y.-S. Differential Analysis of Teachers' Technological Pedagogical Content Knowledge (TPACK) Abilities According to Teaching Stages and Educational Levels. *Sustainability* **2022**, *14*, 7176. <https://doi.org/10.3390/su14127176>
31. Liwei Hsu (2017): Examining EFL teachers' technological pedagogical content knowledge and the adoption of mobile-assisted language learning: a partial least square approach, *Computer Assisted Language Learning*, DOI: 10.1080/09588221.2016.1278024
32. Liu, Siping (2013). Pedagogical Content Knowledge: A Case Study of ESL Teacher Educator. *English Language Teaching*, *6*(7), -. doi:10.5539/elt.v6n7p128
33. Loewenberg Ball, D.; Thames, M. H.; Phelps, G. (2008). *Content Knowledge for Teaching: What Makes It Special?*. , *59*(5), 389–407. doi:10.1177/0022487108324554
34. Ma'mun, T. N., Kosasih, A., Rohmayani, Y., Fimansyah, E.K., & Al- khresheh, M. H. (2021). Foreign language teachers' technological and pedagogical content knowledge: A study with AFL teachers in Indonesia. *Journal of Language and Linguistic Studies*, *17*(4), 1998-2021. Doi: 10.52462/jlls.145
35. Mahdi OR, Nassar IA, Almuslamani HAI: The role of using case studies method in improving students' critical thinking skills in higher education. *International Journal of Higher Education*. 2020; *9*(2): 297–308
36. Mansouri Qadikolaei, A., Marzban, A., & Fakhri Alamdari, E. (2024). Investigating the Level of TPACK among Iranian EFL Teachers in Relation to their Educational Background and Teaching Experience. *Journal of Applied Linguistics Studies*, *3*(2), 1-17.
37. Mansour, N., Said, Z., & Abu-Tineh, A. (2024). Factors impacting science and mathematics teachers' competencies and self-efficacy in TPACK for PBL and STEM. *EURASIA Journal of Mathematics, Science and Technology Education*, *20*(5), em2442.
38. Mihireteab Abraham, Zeleke Arficho, Tesfaye Habtemariam & Abate Demissie (2022) Effects of information communication technology-assisted teaching training on English language teachers' pedagogical knowledge and English language proficiency, *Cogent Education*, *9*:1, 2028336, DOI: 10.1080/2331186X.2022.2028336
39. Muhaimin, M., Habibi, A., Mukminin, A., Saudagar, F., Pratama, R., Wahyuni, S. et al. (2019). A sequential explanatory investigation of tpack: Indonesian science teachers' survey and perspective. *Journal of Technology and Science Education*, *9*(3), 269-281. <https://doi.org/10.3926/jotse.662>
40. Muhamad, N. A. (2014) Investigating the Roles of Motivation and Technological Pedagogical Content Knowledge (TPACK) in Computer Mediated-Communication (CMC) Speaking Skills Instruction. *International Journal of Applied Linguistics & English Literature*. *3*(2), 112-130. <http://dx.doi.org/10.7575/aiac.ijalel.v.3n.2p.112>
41. Muhaimin, M., Habibi, A., Mukminin, A., Saudagar, F., Pratama, R., Wahyuni, S. et al. (2019). A sequential explanatory investigation of tpack: Indonesian science teachers' survey and perspective. *Journal of Technology and Science Education*, *9*(3), 269-281. <https://doi.org/10.3926/jotse.662>
42. Nazari, NaghmeH & Nafissi, Zohreh & Estaji, Masoomeh. (2020). The Impact of an Online Professional Development Course on EFL Teachers' TPACK. *4*. 59-86. 10.22051/lghor.2020.29892.1248.
43. NaghmeH Nazari, Zohreh Nafissi, Masoomeh Estaji & S. Susan Marandi | (2019) Evaluating novice and experienced EFL teachers' perceived TPACK for their professional development, *Cogent Education*, *6*:1, 1632010, DOI: 10.1080/2331186X.2019.1632010
44. Nugroho, B. S., Tannady, H., Fuadi, T. M., Aina, M., & Anggreni, M. A. (2023). Role of Work Experience, Work Motivation and Educational Background on Teacher Performance at Vocational School. *Jurnal Pendidikan dan Kewirausahaan*, *11*(2), 476-487.

45. OlisamaVO, Odumosu MO, Egho EO. The use of internet for teaching effectiveness in mathematics: Benefits and challenges. *A Journal of Educational Research and Development (JERD)*. 2011;6(1):243-248.
46. Ozden M. The effect of content knowledge on pedagogical content knowledge: The case of teaching phases of matters. *Educational Sciences: Theory and Practice*. 2008;8(2):633- 645
47. Ramos, R. A., Babasa, E. E., Vergara, I. B., Manalo, B. I., Gappi, L. L., & Morfi, T. G. (2020). The TPACK Confidence of Pre-service Teachers in Selected Philippine Teacher Education Institutions. *International Journal of Education, Psychology and Counseling*, 5 (37), 196-205.
48. Santos, J., Castro R., (2021) Technological Pedagogical content knowledge (TPACK) in action: Application of learning in the classroom by pre-service teachers (PST). *Social Sciences and Humanities*. <https://doi.org/10.1016/j.ssaho.2021.100110>
49. Scherer, R., Siddiq, F., Howard, S. K., & Tondeur, J. (2023). The more experienced, the better prepared? New evidence on the relation between teachers' experience and their readiness for online teaching and learning. *Computers in Human Behavior*, 139, 107530.
50. Shafie, H, Majid, F.A, & Isnail, I. S. (2022) Developing a 21st Century Technological Pedagogical Content Knowledge (TPACK) Instrument: Content Validity and Reliability. *International Journal of Education*, 14(3), 100-115. doi:10.5296/ije.v14i3.19980
51. Shing, C. L, Mohd, R., & Loke, S. H. (2015) The Knowledge of Teaching – Pedagogical Content Knowledge (PCK). *The Malaysian Online Journal of Educational Science* 3(3), 40-55
52. Shoukat, S., Mamoon, R., & Arif, M. F. (2024). Enhancing Language Proficiency Through TPACK Model and AI Applications A Study on Effective Integration Strategies in English Language Instruction. *Pakistan Languages and Humanities Review*, 8(2), 540-554.
53. Shulman, L. (1987). Knowledge and teaching: Foundations of the New Reform. *Harvard Educational Review*, 57(1), 1–22.
54. So, H.-J. & Kim, B. (2006). Conflicts in pedagogical and technical knowledge: Pre-service teachers' understanding and misconception of integrating technology into PBL lessons. *International Conference for the Learning Sciences 2006*. http://www.lsl.nie.edu.sg/events/ICLS2006_Proceeding_DrSo.pdf
55. Tai, H-C, Pan, M-Y, & Lee, B-O. (2015) Applying Technological Pedagogical and Content Knowledge (TPACK) model to develop an online English writing course for nursing students. 35(6), 782-788 <https://doi.org/10.1016/j.nedt.2015.02.016>
56. Uçar, S. (2023). A meta-synthesis study: An investigation of studies on EFL teachers' technological pedagogical content knowledge (TPACK) competencies in Turkey *Journal of Computer and Education Research*, 11 (22), 1003-1021. <https://doi.org/10.18009/jcer.1355595>
57. Zhakiyanova, Z., Zhaitapova, A., Orakova, A., Baizhekina, S., Shnaider, V., & Nametkulova, F. (2023). Investigation of primary school teachers' professional competencies and Technological Pedagogical Content Knowledge (TPACK) competencies. *International Journal of Education in Mathematics, Science, and Technology (IJEMST)*, 11(5), 1154-1172. <https://doi.org/10.46328/ijemst.3604>