TPACK: Teachers’ Needs

Abstract: The advancement of technology develops a new framework in the education field, known as TPACK. It integrates the theory of pedagogy, content, and technology. Using mix method (qualitative-quantitative) research design, the researchers’ goal was to know the implementation of TPACK in designing lesson plans by English teachers. Furthermore, the researchers decided to use purposive sampling for each education level (junior, senior, and vocational schools) in West Sumatera. To gain the data, the researchers conducted document analysis, observation, questionnaires, and interviews. After analyzing the data, it was found that the teachers in terms of preparing the lesson, the result showed teachers’ pedagogical competence was higher than technological and content knowledge because they adopted lesson plans from the internet. However, regarding the competent of teachers in teaching and learning process, it seemed that they were more competent in technology compared with pedagogy and content knowledge because novice teachers were more familiar in using technology compared to experienced teachers. Surprisingly, in terms of assessment, the teachers were more competent in pedagogy compared with technology and content knowledge. However, content knowledge were not illustrate significantly since they could not understand and develop learning material based on students’ needs. In conclusion, teachers’ competence with TPACK were still below average in terms of understanding the concept, implementation, and assessment, so that they need workshop and seminar to improve their teaching quality and TPACK understanding and implementation.

Abstrak: Kemajuan teknologi mengembangkan kerangka kerja baru di bidang pendidikan yang dikenal dengan TPACK. Ini mengintegrasikan teori pedagogi, konten, dan teknologi. Dengan menggunakan desain penelitian metode campuran (kualitatif-kuantitatif), tujuan peneliti adalah untuk mengetahui penerapan TPACK dalam merancang RPP oleh guru bahasa Inggris. Selanjutnya peneliti memutuskan untuk menggunakan purposive sampling untuk setiap jenjang pendidikan (SMP, SMA, dan SMK) di Sumatera Barat. Untuk memperoleh data, peneliti melakukan analisis dokumen, observasi, kuesioner, dan wawancara. Setelah menganalisis data, ditemukan bahwa guru dalam hal mempersiapkan pembelajaran, hasilnya menunjukkan kompetensi pedagogik guru lebih tinggi dari pengetahuan teknologi dan konten karena mengadopsi RPP dari internet. Namun, terkait kompetensi guru dalam proses belajar mengajar, terlihat bahwa...
teachers lebih kompeten dalam teknologi dibandingkan dengan pedagogi dan pengetahuan konten karena guru pemula lebih terbiasa menggunakan teknologi dibandingkan dengan guru berpengalaman. Anehnya, dalam hal penilaian, para guru lebih kompeten dalam pedagogi dibandingkan dengan teknologi dan pengetahuan konten. Namun, pengetahuan konten tidak tergambarkan secara signifikan karena mereka tidak dapat memahami dan mengembangkan materi pembelajaran sesuai dengan kebutuhan siswa. Kesimpulannya, kompetensi guru dengan TPACK masih di bawah rata-rata dalam hal pemahaman konsep, implementasi, dan penilaian, sehingga mereka membutuhkan workshop dan seminar untuk meningkatkan kualitas pengajaran dan pemahaman serta implementasi TPACK.

**Keywords:** Technology, Pedagogy, Content, Teaching Learning Process, and Assessment

**INTRODUCTION**

Teachers’ proficiency in pedagogic, teaching material, and the use of ICT to develop interactive ELT have to be possessed by teachers. The cruciality of these principles could not be separated and have to be mastered by them because they are the heart of teaching students professionally. For instance, the way teachers prepare teaching activities, materials, and decide on interactive media are important. To have a good comprehension of knowledge, teachers are expected to require language skills proficiency able to teach subject matter with appropriate instructional approaches and methods (Kaur, 2019). To comprehend proficiency, the government released PPG program for teachers or even fresh graduate students. However, the researcher’s experience as the PPG (Pendidikan Profesional Guru) or Teachers Professional Education (TPE) instructor for 2 years found that the teachers did not prepare any lesson plan so they came to class without purpose since a lesson plan goal is to achieve curriculum demands. As a result, as researcher we concluded that there were five impacts: (1) They taught students based on what they can teach, they did not teach what they have to teach, (2) There was no learning purposes, (3) They did not use a media to make it more interactive, (4) Even if they used media, they chose inappropriate media and teaching technique, and (5) They always use similar teaching style every time come to a class. Due to these impacts, the teachers do not understand the pedagogic principles that state a lesson plan as teachers’ guideline.

As teachers’ guidelines, it must be well-prepared because preparation of teaching could be done by teachers when they conduct their lesson plans from their perspectives and curriculum’s goals (cited by Maulani (2019) from Hamer (2017)). In designing lesson plans, they must comprehend curriculum resources, such as interpret and transform the curriculum goals into a lesson design (Policy et al., 2021). Also, teachers have to understand in choosing authentic learning to achieve curriculum goals and emotional and social development of students. In conclusion, to build a lesson design effectively after changing the curriculum goals as learning objectives, they must be able to write it in their mind to control the run of class activities and done effectively after class time with good strategies and well-selected learning material.

However, in TPE students, they did not do well-selected material because they taught students not to achieve learning outcomes since most of them only copied a lesson plan from internet or a web, so that they can not choose what they should teach and how to make it interactive with ICT. Also, recently teachers who did not use ICT while teaching and learning with students could only used conventional teaching style or teacher-centered. As a result, the learning activity was
not interesting for students and the ELT in West Sumatera cannot be well-developed.

Since in conducting a lesson plan, teachers ought to comprehend pedagogical, subject matter (content), and the use of ICT to teach due to the advancement of technology. It caused by teaching and learning process dramatically involves the use of ICT due to the rise of technology (Nadlatul & Surabaya, 2020) and changes ways of teaching and learning process (Koehler, 2006). Since, the educators cannot deny the rising of technology, it synergizes with teaching activities. According to Koehler & Mishra (2008), integrating ICT with pedagogical and content knowledge in the classroom produce innovative framework as technological, pedagogical, and content knowledge after developing Shulman’s principle. As a result, the technology, pedagogy, and content knowledge develop the latest framework as Technological, Pedagogical, and Content Knowledge (TPACK).

The principle of TPACK produces from the theory of concept (subject matter can be taught and learned), pedagogy (instructional practices which are teaching approaches, methods, and strategies), and integration with technology (the electronic devices, such as laptops, projectors, etc.) that produced by Koehler & Mishra (2008). The theory of TPACK integrates and illustrates the highly complex teaching principles because it depends on the teachers to employ those concepts in the teaching-learning process (Alharbi, 2020). In the past time, teachers just required to comprehend knowledge of pedagogy and content (Koehler, 2006). It means teachers only focus on instructional practices and materials. Sulman’s theory in Nazari et al. (2019) state that teachers are qualified to master the pedagogy and content knowledge to produce satisfying teaching and learning process. An integration of pedagogy and content knowledge known as pedagogical and content knowledge (PCK). In addition, Jones & Moreland (2015) argue that PCK determines as the core of curriculum and strategy of teaching made by teachers. In conclusion, PCK is teachers’ quality of understanding the curriculum’s goals and decision-making on teaching strategy for teaching materials in the learning process. Furthermore, their development of PCK is separated as the following figure 1.1.

File: 1-Sep-ratedpedagogyandcontentknowledge.png
Figure 1. Separated pedagogy and content knowledge
Lately, both pedagogy and content knowledge collaborate as PCK. According to Shulman (1986) in Nazari et al. (2019), a lesson will be successful when teachers consolidate pedagogical and content knowledge, as the Figure 2 bellows:

File: 2-PedagogicalandContentKnowledge(PCK).png
Figure 2. Pedagogical and Content Knowledge (PCK)
Now, Mishra & Koehler (2008) argue that the advancement of ICT, PCK develops into TPACK. Schmidt et al. (2009) believe that teachers need to comprehend three core components: technology, pedagogy, and content. In conclusion, that TPACK means teachers’ competency instructional practices (pedagogical knowledge), subject matter and its development (content knowledge), and integrating various interactive media with ICT (technological knowledge). As a result, teachers are not only focus on subject matter and principle of teaching to achieve curriculum demands, but also integrate teaching principle and learning material into
interactive style by using technology as a supporting area in teaching and learning process. Hence, the intersection between PK, CK, and TK can be seen in Figure 3.

![Figure 3 TPACK Framework](image)

Previous research explained that professional lecturer more focused on the implementation of technological knowledge rather than the pedagogy and content area (Cox & Graham, 2009). The data displayed on depth and complex construction of technical uses and special features of TPACK. However, the research did not describe both pedagogical and content knowledge information in detail while they are also part of teachers’ professionality disciplines because they focus on how teachers understand TPACK and implement it? Hence, the development of TPACK from teachers rather than lecturer is vital to gain accurate explanation of extended understanding.

In extending the knowledge, implementation of TPACK in preparing the activity is required (Alharbi, 2020). He presented data of CK, PK, and TK in general and use male and female gender as other variable. The data displayed that both male and female EFL teachers presented different level of implementation and experiences. In detail, the implementation of TPACK was significantly different with CK as the highest score of knowledge in Madinah City.

However, the problem was this research only focus on differentiating there core components of TPACK rather than the significant of implementation the intersection knowledge of TPACK during learning process. Moreover, the result showed that the relation of experience in implementing TPACK separately did not present any significant result.

However, Keser et al. (2015) presented that PK, CK, and TK competencies and self-efficacy were showed their relation each other. Their correlation’s result showed positive correlation between the integration of technology and teachers’ TPACK competencies with bigger challenges of implementation of IT.

Moreover, Tseng et al. (2011) argued that the implantation of technological tools can be integrated with traditional teaching sequence: present-practice-produce. Those could be PowerPoint and web blog that particularly participated for teaching purposes with computer integration. In contrast, Bingimlas et al. (2018) stated that the involvement of TPACK in teaching showed an effective teaching in Saudi Arabia. The participants were selected randomly around Saudi Arabia who wanted and interested about teachers’ TPACK competencies. As the result, teachers’ preparation from traditional teaching improved to advanced approaches with technology, even the result seemed bias.

In conclusion, there were many studies of TPACK that still need improvement and more detail explanation. The details needed are teachers’ competencies of TPACK in preparing, implementing, and evaluating learning activity and the application of TPACK in teaching students by teachers. Theoretically, TPACK must be one integration that have to be well-used by teachers. Unfortunately, some teachers ignored the components of TPACK for teaching and learning process. As the result, the objective of this research is to know English teachers’
competencies in teaching using TPACK in the classroom. Due TPACK is teachers’ needs in integrating teaching process.

METHOD
Research Design
This research conducted through mix methods design. According to Creswell (2012), mix methods is a combination process of quantitative and qualitative design by obtaining and analyzing data. Furthermore, the data are collected to portray beyond the frame of “what?” and “how many?” to present the process in a particular situation/setting (Miles et al., 2014). Hence, the process of collecting data through quantitative and qualitative design are to enhance the result of the research in a particular setting by triangulate the result.

A questioner and an interview were utilized to determine teachers’ TK, observation and documents were analyzed to obtain data from PK, and a test and a document were used to collect information of CK. First, teachers’ TK was analyzed from a questioner to collect data about teachers’ competency of technology and an interview was used to validate teachers’ TK implementation. Second, PK of teachers was obtained by using documents analysis (teachers’ lesson plans) and classroom observations. Third, a development subject matter test was used to discover teachers’ CK development material and a document (lesson plan) was analyzed to collect detail information of learning sources and material. The next stage was to explore teachers’ TPACK comprehension.

Population & Sample
Population is a group of people/organizations with similar characteristic to be identified by the researcher (Creswell, 2012). As the result, the population of this research was all English teachers in West Sumatera Level. They have same characteristic that is teaching English as foreign language at schools. In detail, those population narrowed as research sample by using purposive/judgmental sampling technique. According to Ranjit (2011), purposive/judgmental sampling is selecting research sample based on individual/group who can give the best information to answer research question(s). It has criteria, those are location, specific experience, specific level, age, or gender. However, the researchers chose the sample by using location of schools, schools’ accreditation, class level, and teachers’ experience.

In selected the schools, it based on schools’ accreditation was chosen from Badan Akreditasi Nasional Sekolah Menengah (BAN-SM) website. The researchers decided to choose A and B accreditation only because of their total score range. For A accreditation, the score is from 90-100 while B accreditation is 80-90. Moreover, the score is selected from variety criteria: teaching performance, school location, subject matter, school’s facilities, and school management. Also, the result of schools’ accreditation determined the area or location of the research. As the result, the samples were accessible to conduct this research was Bukittinggi City, West Pasaman Regency, and Solok Regency. Furthermore, the schools were chosen to be the research sample also narrowed by selected the teachers based on their teaching experiences, which were five or above five years.

Instrumentation
The data of this research divided into two sources: quantitative data and qualitative data. According to Ranjit (2011), explains that both quantitative and qualitative data also have primer and secondary sources. To be specific, primer data collected from questioners, interview, test, and observation, while secondary data obtained from document. Furthermore, document divided into public documents (school documents, news, previous research, etc.) and private documents (government documents, personal records, diary/journal, etc.) (Creswell, 2012). In this research, the researchers used questioners,
observation, and interview as primary sources, while school document (teachers’ lesson plans) used as secondary source.

**Technique of Data Collection and Data Analysis**

1) **A Questioner**

A questioner was designed based on participants’ answers of survey to complete the data of the research (Creswell, 2012). According to Vagias (2006) a range of questioners used Likert scale to measure the scale was Strongly Agree, Agree, Disagree, and Strongly Disagree. Furthermore, the researchers determined the maximum and minimum data by measuring mean and standard deviation.

**Table 1 Score Category**

| Interval                  | Category  
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X &gt; M + 1,5 SD</td>
<td>Very High</td>
</tr>
<tr>
<td>M + 0,5 SD &lt; X ≤ M + 1,5 SD</td>
<td>High</td>
</tr>
<tr>
<td>M - 0,5 SD &lt; X ≤ M + 0,5 SD</td>
<td>Average</td>
</tr>
<tr>
<td>M - 1,5 SD &lt; X ≤ M - 0,5 SD</td>
<td>Low</td>
</tr>
<tr>
<td>X ≤ M - 1,5 SD</td>
<td>Very Low</td>
</tr>
</tbody>
</table>

Note:  
M = Mean  
SD = Standard deviation

2) **Interview**

The interview developed from teachers’ lesson plans using semi-structured interviews “in-depth interviews,” which are less structured. Also, the interview divided into the interview questions, raw data, preliminary code, and final code. To be specific, the primary data was teachers’ statement about TPACK understanding and implementation, so the researchers analyzed their statement by grouping it based on TK, PK, and CK.

3) **Observation**

Observation is collecting open-ended and firsthand information from people and places (Creswell, 2012). This technique gives an opportunity to find participant’s behavior as research sample. The observation conducted based on the data needed and using fieldnote/note-taking technique. During the observation, the researchers focused on detail of TPACK implementation during classroom activities during three time observations.

4) **Analysis Document**

Since the documents were teachers’ lesson plans, it was analyzed using content analysis. Content analysis was analyzing data from document’s information. The information occurred was TK, PK, and CK.

5) **Developing Material Test**

Test was conducted to measure teachers’ competency in developing content material. The sample test was using News Items Text. There were two indicators: (1) teachers’ knowledge of subject matters, and (2) teachers’ knowledge of developing material.

**Table 2 Developing Material Test Indicators**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Indicators</th>
<th>Sub-Indicators</th>
<th>Number of Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content Knowledge</td>
<td>Subject Matter Comprehension</td>
<td>Concept of the text</td>
<td>1-2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identifying the text</td>
<td>3-7</td>
</tr>
<tr>
<td>Developing Materials Skills</td>
<td>Knowledge of improving the text, source, and material</td>
<td>8-10</td>
<td></td>
</tr>
</tbody>
</table>

6) **Validity**

The validity of this research occurred functionality, profitableness, and accuracy of instrumentations (Fraenkel et al., 2009). There were three types of validity: construct-validity, content validity, and criterion-related validity. In this research, the researchers used content validity to know the content of instrumentations. Therefore, the validation did by one of senior lecturer at Universitas Negeri Padang (UNP), who hold Micro Teaching and PPG courses.

7) **Reliability**

Reliability examined the consistency of instrument during the research process. Hence, the researchers used the Cronbach’s Alpha technique to examine the reliability of the instrument. Frequently, the value of Cronbach’s Alpha is 0.50 or above. Also, the instruments were TK’s questioners and CK’s
Test. In detail, TK’s questioner result of reliability value was 0.982 > 0.50 which meant the reliability of questioners could be categorized good. Furthermore, the reliability value of CK’s test was 0.8 ≤ r_{11} ≤ 1.0 which meant the reliability was very high.

**RESULTS AND DISCUSSION**

**Results**

**Data Description & Analysis**

These findings were from questioners, documents, a test, and an interview. The research grouped into teachers’ understanding from TK, PK, and CK.

1) **Technological Knowledge (TK)**

In this category, the researchers classified TK as four indicators: teachers’ TK comprehension, TK tools in designing lesson plan, implementation of TK in learning process, and TK in assessing students. These data were obtained from questioners, interview, and document analysis. However, the data of TK was shown a big differences between novice teachers and experienced teachers since they had different generation. The novice teachers (5 years teaching experiences) illustrated a high competency of TK since they were familiar with technology compared to the experienced teachers (above 5 years teaching experiences).

To be specific, the experienced teachers were not skillful with technology, so that their TK understanding, the ability in designing lesson plans, the application during teaching and learning process, and assessment process were mostly very low up to average. The result of these data can be seen from the tables bellow.

a) **Teachers’ TK Comprehension Level**

<table>
<thead>
<tr>
<th>N</th>
<th>Level</th>
<th>F</th>
<th>P</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Very Low (38)</td>
<td>1</td>
<td>6%</td>
<td>38</td>
<td>65</td>
<td>3.38</td>
<td>0.32</td>
</tr>
<tr>
<td></td>
<td>Low (54)</td>
<td>1</td>
<td>7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average (56-60)</td>
<td>9</td>
<td>63%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High (&gt; 61)</td>
<td>3</td>
<td>24%</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

As displayed on Table 2, the description of statistic data from teachers’ TK comprehension level shows that there were 14 participants. The maximum score was 65, and the lowest score was 38. Furthermore, the participants’ average comprehension level was 63%, and standard deviation was 0.32.

The questionnaires revealed the data of four levels of teachers’ comprehensive TK were understood by teachers. According to the result, the analysis displayed very low comprehension was 1 (6%) teacher who scored very low; 1 (7%) teachers scored 54; nine teachers scored between 56-60 (63%) showing average comprehension; and there were 3 teachers scored > 61 (24%), therefore illustrating high level of TK comprehension.

b) **Teachers’ Ability in Using TK Tools in Designing Lesson Plans**

<table>
<thead>
<tr>
<th>N</th>
<th>Level</th>
<th>F</th>
<th>P</th>
<th>Min</th>
<th>Max</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Very Low (&lt;52)</td>
<td>1</td>
<td>6%</td>
<td>42</td>
<td>69</td>
<td>3.38</td>
<td>0.41</td>
</tr>
<tr>
<td></td>
<td>Low (53-60)</td>
<td>2</td>
<td>12%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Average (61-67)</td>
<td>6</td>
<td>42%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>High (&gt; 68)</td>
<td>5</td>
<td>40%</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

The table 3 displays the information of teachers’ statistic on using TK tools in designing lesson plans that the participants were 14 teachers. The minimum score was 42, while the maximum score was 69. The SD was 0.41 with the standard level of participants was 42%.

The data showed from the questioners were four level of teachers’ competency in designing lesson plans using TK tools. Based on the data, the statistic revealed very low
ability was 1 (6%) teacher who scored <52, 2 (12%) teachers scored between 53-60; six teachers were average level with score between 61-67 (42%); and there were 4 teachers scored >68 (40%), therefore showing high level of ability in using TK in designing lesson plans.

Furthermore, based on the result of the interview, the majority technology used by the teachers were social media platforms (such as; Blog, WhatsApp, and Youtube), LMS (Learning Management System) platforms (such as; Google Classroom and Edmodo), software conference (such as; Skype, Google Meet, and Zoom), Microsoft Office applications (such as; Word, Excel, and Powerpoint), Learning quiz maker and online assignment (such as: Kahoot, Google Form and Quizizz), learning games (such as: Bamboozle, Oodlu, and mentimeter), online resources (newspaper, magazine, television website like NBC or CNN), Google Workspace (such as: Google Document, Google Sheet, and Google Slide), image editor (Adobe Photoshop, Corel Draw, Canva, and Adobe Illustrator ), video editor (such as: Movie Maker, Power Director, Kine mAst er, Filmore and Adobe Premiere), use a tablet/mobile device (smartphone), computer/laptop, connection devices (such as: Bluetooth, Wi-Fi, Hotspot), LCD projectors, and printer.

c) Teachers’ Teaching Performances in Using TK

The data showed in the Table 5 explained the data about teachers’ competency in using TK while teaching performance in the classroom. The questioners were 30 questions with 40 teachers as the participants. The lowest score was 59 and the highest score was 118. Moreover, the mean of participants’ competence was 3.35 with 0.45 SD.

The statistic displayed four levels of teachers’ competence in using TK while teaching in the classroom. Based on the result, the analysis illustrated very low skill was 1 (4%) teacher who scored very low; 1 (6%) teacher scored 86; the 49% from seven teachers score between 88-108; and there were 5 teachers scored above 109 (41%) which illustrating high level of teachers’ TK skills in implementing it in the classroom.

Also, regarding the result of interview, several types of technology used in the teaching and learning process were computers/laptops, LCD projectors, LMS (Learning Management System) platforms (such as; Google Classroom and Edmodo), and social media (such as; Blog, WhatsApp, and Youtube), used a tablet/mobile device (smartphone). These variation of TK happened since the pandemic which forced teachers to design online learning. Also, by using variety of media made students were interested and engaged to learn.

d) Assessing Students with TK

The Table 6 presented the statistic that used 19 items of questioners to show teachers’ competency in assessing students with TK. The minimum score was 52 and the maximum score was 76. Also, the average mean of participants’ responses were 3.57 with 0.28 of SD.

The Table illustrated five levels of teachers’ TK in assessing students. According to the result, the 1 (6%) teacher had very low score; 1 (7%) teacher also had score 62; the 63% from nine teachers were having average
level; 2 (16%) teachers scored between 71-74; and the very high score was 1 (8%) teacher with 76 score.

Furthermore, the interview displayed the technology used by teachers included computers/laptops, connection devices, Microsoft Office applications, and social media. And then, some of the teachers used Google Forms and Quizizz. These variety presented the novice teachers were more proficient in assessing students based on technology rather than experience teachers since they could use wide range of TK tools.

2) Pedagogical Knowledge (PK)

The researchers grouped PK into several sub-indicators, that were teachers’ competency in preparing a lesson, teachers’ teaching performance, and assessment process.

a) Teachers’ Competency of Preparing A Lesson

According to the result of document analysis, the data of teachers’ PK in preparing a lesson based on teachers’ lesson plans. In teachers’ lesson plans, they were included learning approach, method of teaching, learning stages or teaching procedures, and type of evaluation students. To be specific, the learning approach used by teachers was a scientific approach, while the method of teaching was inquiry/discovery learning.

Furthermore, learning stages or teaching procedures had three sub-stages: (1) pre-teaching, (2) whilst-teaching, and (3) post-teaching. In their lesson plans, some procedures had been deleted since time of learning were using COVID-19 pandemic time management, so that the teachers could not develop the learning with completed steps. Moreover, the assessment processes were divided into three categories. Those were psychomotor assessment, cognitive assessment, and behavior assessment. Also, the teachers provided the assessment criteria with using Brown theory.

b) Teachers’ Competency on Teaching Performances

The data was collected from classroom management and the implementation of assessments. To be specific, in managing the classroom activity, the researcher found about the implementation of learning phase, teachers’ intonation, teachers’ movement, classroom language, and grouping technique.

In addition, the data was from teachers that had different style of teaching even they used same approach and method. During the observations. However, during the observation, most of the teachers did not follow the guideline have been made previously. It reflected that only pre-teaching was similar with what have been written in their lesson plans. However, during the whilst-teaching, the researcher found that the learning stages implemented were not same with lesson plan, except Teacher 3. She[he] had good implementation of her[his] lesson activity. It displayed with her[his] teaching performance quite similar with the lesson plan. Meanwhile, three of the participants only focused how to finish the material quickly. Also, the teachers used variety of voice tone to help students stressed the sentences or explanations of them, even they mostly explained the material using Indonesia language rather than English. It made them did not well-applied or even not applied the stages have been decided with better comprehension of English. However, the way teachers arranged students’ sitting and grouping technique helped students to work corporate with their classmate easily.

On the other hand, assessment session was its implementation from the lesson plan during the class activity. In detail, the behavior assessment conducted by teachers through their observation during teaching process. Then, they took a note from
students’ habit and attitude during the class activities. Meanwhile, the cognitive and psychomotor assessment conducted after the teachers explained or verified the material or information in their explanations.

c) Teachers’ Competency in Assessing Students

There were three assessment criteria, they were behavior assessment, cognitive assessment, and psychomotor assessment. To implement the assessment process, the teachers did it during the classroom activity. To be specific, the behavior assessment obtained from teachers’ document rubric that found in their lesson plans appendix. It consisted of religious behavior and daily characters during the lesson. Meanwhile, the cognitive assessment gathered from students’ result of tests or assignments that recorded by the teachers in their evaluation book; also, the psychomotor assessment from students’ active participation or presentation during classroom activity.

3) Content Knowledge (CK)

The researchers classified CK by teachers’ CK knowledge competence – definition of the text and identifying the text – and teachers’ comprehension in developing material. It can be seen from The Chart 1 bellows:

![Chart 1 Teachers' CK Competency](image)

The Chart 1 provided information of teachers’ CK competency statistic in three categories. The teachers’ skill in understanding the definition of the text was 43% as the highest competence of CK; 25% for teachers’ knowledge in identifying the text; also, 32% of teachers’ comprehension in developing material. Furthermore, the chart illustrated that all of teachers’ CK competency were below of 50% which meant it was lacking.

To be more specific, the result of understanding the text was higher than the other components due to their familiarity with the text. Since the teachers were copied the text from the internet and had been taught the similar text to students for years, so they were easily to understand the text. However, for identifying and developing material, teachers were hardly to comprehend these level since they were adopt the material from internet.

The impact of adopting teaching material from the internet was caused teachers did not teach students based on their material understanding and level.

Discussion

Based on the results of the investigation, the researcher discovered that teachers currently use technology in their lesson plans, teaching and learning activities, and student evaluations. According to Trillig & Fadel (2009) one method for ensuring that pupils understand 21st-century skills requires teachers to use technology while students are studying. The skills that must be developed at this time was:

- Capabilities for learning and creativity. This skill dealt with how a teacher might use Bloom's Taxonomy to help pupils develop their critical thinking and problem-solving skills. Remembering, comprehending, applying, analyzing, evaluating, and producing were all listed in Bloom's taxonomy. Collaboration and communication are the following abilities. By having students work in groups to communicate, teachers can develop this ability. The final item was innovation and originality. By using technology into the teaching and learning process, teachers may create a variety of learning activities and exercises for students. Otherwise, the data the researcher uncovered indicated that many
teachers did not make the best use of technology.

As a result, to fulfill learning objectives in the 21st-century, the teachers must to comprehend their competency of design and development of technology in education (Keengwe et al., 2009). Also, he explained that using technology could lead into flexibility of learning process and empower students to be the center of learning, so that technology was a tool to equip educators and students in developing the learning process (McCormick & Scrimshaw, 2001). However, when experience teachers were not familiar and do not have personal TK tools, especially laptop, they taught students conventionally.

Therefore, according to Sanjaya (2007) pedagogical knowledge (PK) is a framework of instruction that begins by organizing the sequence of content before being creatively designed. Also, teachers already creatively develop the lesson plans using a variety of techniques. It was a reflection of how instructors' evaluation methods and learning stages had developed. Additionally, in terms of pedagogical knowledge, Hofer (2001) notes that it entails picking the right strategy and techniques, choosing a learning activity, and picking the right evaluation. Additionally, Harmer (2007) states that effective classroom management skills enable teachers to provide effective lessons. When students receive better evaluation results, the management of the classroom improves (Oliver, 2007). The teachers had presented the classroom management based on the information gathered during the investigation. They already control the class by motivating them with a variety of voice tones. Depending on the circumstances, teachers talked at a variety of voice volumes. It demonstrated that classroom dynamics are under the control of the teachers. In addition to Harmer and Oliver, Harrell (2007) argues that the effectiveness of teachers and the way they set up their classrooms has a positive effect on students' abilities. Teachers used the traditional seating arrangement while setting up the classroom. Due to the teachers' clear communication, this style of organization had a distinct effect on the pupils, who could participate in the lecture.

Three different forms of assessment were applied by the teachers in accordance with the 2013 Curriculum. These included assessments of behavior, cognition, and psychomotor function. These evaluations are used to meet learning objectives (Taras, 2010). As well, the formative assessment displays the way teachers acknowledge their efforts by providing feedback on their results in relation to the learning aim (Nicol, 2009; Nicol & Macfarlane-Dick, 2006). Based on the information presented in the findings, teachers have previously utilized assessments to accomplish learning objectives. It included form exercises, assignments, a discussion board, and a form for evaluating conduct.

Furthermore, Koehler & Mishra (2008) define content knowledge as familiarity with the topic area. A subject-matter professional will dedicate significant concepts to working memory and draw students' attention to their prior knowledge. According to Shulman (1989), teachers need to be able to describe the topic for pupils and explain to them why it is important. Before starting a discussion on the subject, teachers must define the subject for the students. Students need to understand why they are studying the material.

Nevertheless, it seemed like the teachers were having trouble understanding the material. According to Irfan et al. (2018), the teacher only maintained or memorized the information without truly understanding or comprehending its contents. This issue arose in this investigation because no participant was able to recognize the text's 5W+1H or the mistake phrase. Most of them could only briefly mention the text's general structure; they were unable to elaborate because the material was not developed by themselves.
Hence, they could not use it appropriately since it did not reflect students’ needs and curriculum demands.

The results illustrated that the teachers did not create their content and rather downloaded it from the internet. Few teachers offered pupil enrichment and remedial materials, and the majority of teachers simply assigned one or two works to the students.

Three factors, according to Mardiana (2018), explain why the teachers did not create the content. First, teachers found it difficult to communicate their ideas for developing instructional materials. Second, teachers seldom ever develop and use educational media. Last but not least, due to a lack of resources for teaching materials that the teacher could use as a reference in creating materials, the instructor was only led by books.

CONCLUSION

This research aims to investigate teachers’ competency of TPACK in teaching and learning process. Based on the result and discussion, the researchers concluded that most of teachers’ TPACK level of understanding is still below average because there was many misleading of principles. It could be seen from their capability in understanding the concept of technology, pedagogy, and content knowledge. Additionally, the comparison of three knowledges were technology, pedagogy, and content knowledge as the least principle well-understood by teachers since it requires more depth-comprehension of developing subject matter.

However, some teachers in West Sumatera already had a good implementation of TPACK’s theory and practical in the classroom. They have tried to explore and applied the theory into practices. It could be seen from how high their score in implementing TK, how well they organized the classroom and gain students’ attention, but still they were lacking in CK. It might happened due their different generation and teaching experiences. For novice teachers, they were mostly showed highest score in TK rather than PK, and CK. However, experiences teachers presented high quality of teaching by well-understanding PK, than TK and CK. On contrary, both novice and experienced teachers were not shown significant competency of CK.

From this the highest competency of teachers was TK, followed by PK, and the last one was CK. By these frameworks, the researchers suggested the next study could be conducted through the analysis of TPACK’s benefits for teaching and learning activity, teachers’ strategy in developing teachers’ needs, and also type of CK competency that implemented by teachers.

The researchers suggest that teachers need more training on improving their TPACK understanding and how to implement it because TPACK is teachers’ needs in teaching process. To illustrate, a seminar and a workshop will help teachers to comprehend each component of TPACK.

REFERENCES


