Integrating TPACK based HOTS-Textbooks: A case study to attest teaching style in primary school

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Abstract
This study discusses TPACK based HOTS textbook that changes the teacher’s mindset in implementing learning in the classroom. The learning which combines technology and science will be interesting and innovative. A case study for Single-Case Design in qualitative research was used for this study through the technology use problem faced by the teacher in a rural area. The teachers from elementary school are chosen as the respondents of this research based on self-selection. Data were taken and collected using interview recording that uses an online method within two weeks of classroom learning applied. The use such a TPACK based HOTS textbook is still the main priority of teachers to communicate in classroom learning because class interaction is more active than using only manual term of activities. And again, the use of combination between technology and content knowledge as a distributed device can change teacher mindset and student character in learning, because they feel comfortable to make a contact each other. Moreover, the results of this study will give two benefits on both how to choose the best way in the class circle effectively and how to adapt for new normal from COVID-19 pandemic in class interaction.

Keywords
TPACK, HOTS, and class interaction

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In the last four years, research on Technological Pedagogical Contents Knowledge (TPACK) has produced many new practices and theories as well as policies in learning in various fields. For example, research by Gill et al., which provides TPACK knowledge to pre-service teachers (Gill & Dalgarno, 2017; Tondeur, Scherer, Siddiqi, & Baran, 2017) and (Cheng, 2017) suggested training model for English teachers with TPACK. Research by Zhang was involving senior and junior teachers in the implementation of TPACK (Zhang, Liu, & Cai, 2019), and Akyuz (2018) assessed competency through TPACK. However, there has been no research on the application of TPACK that integrates HOTS questions in learning. Therefore, this current research aims to examine how HOTS questions in textbooks can be integrated into learning with TPACK. The preview research findings concluded that TPACK based HOTS focuses on how knowledge of technology (Technological Knowledge), knowledge of pedagogy (Pedagogy Knowledge), and knowledge of content (Content Knowledge) can be combined in a learning. And it has problem solving thinking and later makes effective and successful interaction in a learning process or context of learning. Instructors who use adaptive learning interactions in practical activity give accurate challenges and opportunities presented from TPACK. (Paneru, 2018). The teaching performance of curriculum instructors in implementing TPACK from the development of cognitive preparation illustrates that teachers’ mentoring and coaching is in the positive scenario, with a proportion of 84.66 percent (Ismail, RazifZaini, Hamid, & ZulkellifiHamat, 2021). There are three positive aspects to the benefits of TPACK: (a) the classification and use of instructional experiences and technology becomes much more knowledgeable, tactical, and multifaceted; (b) educational strategic plan becomes more student-centered, concentrating on student intelligence rather than constructive participation; and (c) principles for technology adoption are enhanced, resulting in knowledgeable utilization technology in education. (Harris & Hofer, 2011). The use of new instructional technology and pedagogical approaches, such as digital game-based learning, results in substantial improvements in teacher development. As a result, using a conceptual framework for technology adoption, such as TPACK, as an investigative perspective is beneficial (Evans, Nino, Deater-Deckard, & Chang, 2015). The TPACK assessment can be a powerful technique for evaluating the amount of technological, pedagogical, and content knowledge in participants (Benson & Ward, 2013). The benefits of technology in the learning process are, 1) for students to increase attention, concentration, motivation, and independence; 2) for teachers it can reduce the use of material delivery time, make the student learning experience more enjoyable, design material more interesting, and encourage teachers to improve their knowledge, and computer skills (Wahyuni, Sukestiarno, Waluya, & Aminah, 2021). The other researchers concluded that TPACK for elementary school teachers in Indonesia in teaching science content in the 21st Century need to know, because TPACK may aid in identifying the impact of the program, professional development course, or narratively characterizing instructor professional growth This demonstrates that TPACK is a component that may be utilized to improve academic achievement (Suryani, Rahayu, & Saptono, 2021). TPACK is very essential for elementary school teachers in developing specific strategies in technology integration that supports learning standards in the classroom technology integrated (Bakar, Maat, & Rosli, 2020). On the other hand, there is a level of difficulty in improving a new technique to use a term of new technology in class interaction because teachers would rather that they used face to face interaction to teach, of course many instructors do not care about the development of teaching using the technology. In other case, they still have limited skill to operate kinds of new term of technology. The authors have a strong desire to reveal the source of the problem about technology use in classroom interactions between the teachers and students occurred, as follows: 1) Can TPACK based on HOTS in social studies in elementary schools help to solve problems that occur in less effective teaching patterns in the current new normal?; and 2) Why is face to face teaching still the leading choice in the class interactions?. At the end of the study, it is strongly believed that the results of the disclosure of this research problem will have a significant benefit to the continued use of the TPACK based HOTS in the process of teaching and learning, especially in Blitar City. These results will be of great interest to the change of teaching style in COVID Pandemic situation. Elementary School Lab. UM Malang in Blitar is a school that was established in the since 21 years. As elementary school in Indonesia in general, the period of education in this school is taken within six years of learning. The instructors and students mostly come from the city of Blitar itself, so the local culture of Blitar is very close in the patterns of interaction of learning. A mixture of among customs, social behavior, education, relations between communities, and the
use of manual interaction is still used in class activities. On the other hand, the use of a pattern of combining technology and science must be used as the class instruction all levels of education (Utama, 2020). In the current education system, interactions must use technology as a formal principle recognized by the state to live inside today condition of Covid Pandemic that communication between teachers and students in learning interactions must use term of technology as the primary communication tool. Other acquisitions in each region, especially Blitar city, have the local used as a communication tool for generations in all formal and informal sectors, especially education. That issue becomes the polemic in learning because most teachers still do not care about the important use of technology.

Theoretical Framework

Social Studies as a subject in the school

Social studies education as a subject is a simplification of social science and is an interdisciplinary science, so that social studies education examines a problem from various social science perspectives in an integrated way (Duke, Halvorsen, Strachan, Kim, & Konstantopoulos, 2021). Geography, archaeology, sociology, anthropology, psychology, finance, public administration, law, and some other relevant fields provide raw resources for the establishment of current educational curricula in elementary and secondary schools (Dawal, 2021). The purpose of social subjects classes in primary schools is to foster a logical perspective toward sociological phenomenon as well as knowledge into the history and current growth of Indonesian community and global population (Ajeng, 2021). The purpose of Social Studies as a subject in the school is to increase human dignity as social beings and to achieve this, a rational socialization process is needed (Dawal, 2021). The goal of social subjects disciplines in primary schools is to provide adolescents with fundamental information and skills that will help them in regular activities, as well as to build an awareness of the evolution of Indonesian people from the perspective of time (Ajeng, 2021).

TPACK (Technological Pedagogical Contents Knowledge)

TPACK is a model used for the integration of technology into education (Tuzahra, Sofendi, & Vianty, 2021). TPACK is an unique form of knowledge that instructors must comprehend in order to effectively integrate technology into classroom. TPACK is awareness of how to apply appropriate technology in acceptable pedagogies to train and educate material (Mutiani, Supriatna, Abbas, Rini, & Subiyakto, 2021). TPACK is knowledge to integrate technology into the teaching of certain materials (Novidsa, Purwianingsih, & Riandi, 2021). TPACK is the ability of teachers to organize learning by integrating learning strategies and technology (Farrell, Newman, & Corbel, 2020). TPACK is a framework for integrating appropriate pedagogic technology to explain content (Wijaya et al., 2020). TPACK is a theoretical framework for designing learning models by integrating three main aspects, namely technology, pedagogy, and content (Rahmatullah, Praherdhiono, & Wedi, 2021). According to Rasyidin, the TPACK concept involves 7 following knowledge domains as follows:

- Material knowledge (content knowledge/CK);
- Pedagogical knowledge (pedagogical knowledge/PK);
- Technological knowledge (TK);
- Pedagogical and material knowledge (pedagogical content knowledge/PCK);
- Knowledge of technology and materials (technological content knowledge/TCK);
- Knowledge of technology and pedagogy (technological pedagogical knowledge/TPK);
- Knowledge of technology, pedagogy, and materials (technological, pedagogical, content knowledge/TPCK) (Hadisi, 2017).

Practical applications of TPACK are:
- Using ICT to assess learners. Example of you using Microsoft excel to process grades, use online quizzes to assess participation of students, using group chats to understand how to communicate through social media and so on.;
integration of technology to support learning strategies in the field of study (Rahmatullah et al., 2021); and

• Applying ICT for learning management. For example, using ICT for online attendance, entering and processing student values, using academic information systems and so on (Bakar et al., 2020).

HOTS (Higher Order Thinking Skills)

Higher order thinking skills or also known as Higher Order Thinking Skills (HOTS) are the demands of the 2013 Curriculum. Higher order thinking skills in learning are the application of thinking processes to complex situations and have many variables (Shidiq, Masykuri, & VH, 2015). HOTS is not just a question model, but also includes a teaching model. The teaching model must include the ability to think, examples, apply thinking and be adapted to the needs of different students (Pratiwi & Mustadi, 2021). HOTS, or higher-order thinking skills, are highly intellectual activities that require abilities in analyzing, evaluating, and generating content in dealing with and solving complex subjects (Sarnoko, Budiyono, Suryani, & Asrowi, 2021). This ability examines a problem and is able to use its knowledge in new situations (Suhendro, Sugandi, & Ruhimat, 2021). Higher order thinking skills, also defined as analytical and critical thinking abilities, are processing abilities that involve more than only memorizing, reconfirming, and referencing without evaluating, but also the capacity to think creatively, imaginatively, be innovative, and address problems (Ginting, Hasnah, Hasibuan, & Batubara, 2021). Higher Order Thinking Skills (HOTS) are the capacity to interpret or create content, draw inferences, construct visualizations, examine, and correlate knowledge (Ibrahim, Akmal, & Marwan, 2021). The strategy for compiling HOTS-based questions includes several steps, namely (1) analyzing basic competencies, (2) making question grids, (3) using problems related to everyday life, (4) compiling items and (5) making guidelines: scoring (Andaria, Sasongko, Kristiawan, Walid, & Kusumah, 2021).

Method

A case study for Single-Case Design in qualitative research was used for this study. Two teachers of social studies from elementary school Lab. UM in Blitar were the subjects of the research selected based on self-selection following the needs of the problem. The process of data collection uses the depth interviewing through the online system as follows: 1) the writer sends interview sheets to the two teachers who are the subject of research through the online system, the WhatsApp application; 2) within two weeks, the participants have the opportunity to answer interview sheets designed according to research needs; and 3) the results of the interview sheet are sent to the author. Then, of course, there is a feeling of professionalism in the interviews. The investigator has invited the responder whether he would offer some time and share some of his thoughts, not in a casual conversation, but in a scenario in which the researcher will document or note down (Bassey, 1999). Data in this study were collected using interview recording that uses an online system within two weeks of classroom learning applied because of the crisis policy COVID 19. The method of taking the data will produce outcomes under the objectives of the research. In analyzing the results of interviews, they start from 1) summarizing all the answers from the subjects related to the research question; and 2) sorting out summary results that are focused on the research problem. Then, they formulate the final results obtained, as follow:

1) Organize and prepare the data for analysis;
2) Read or look at all the data;
3) Start coding all of the data;
4) Generate a description and themes;
5) Representing the description and themes as the finding of this research Paoletti, Bisbey, Zajac, Waller, and Salas (2021).

Case study analysis is richly descriptive as it is focused on broad and varied sources of knowledge. It uses quotes from key players, stories, interview processes, and other literary strategies to construct visual images that bring to life the nature of the many variables involved in the phenomenon being studied (Paoletti et al., 2021).
In carrying out research, we make the following steps from the initial stage to the final stage or interpretation of research results as follows:

1) identify the volunteers and setting of investigation appropriate to the subject;
2) communication with instructors as a first phase toward research implementation;
3) Data collection through interview layers distributed via WhatsApp group;
4) going through the rounds of interview data acquisition that are suitable for the case study technique;
5) Interpret full data analysis as the study’s ultimate conclusion.

**Result and Discussion**

The authors establish the place and subject of study at the phase of location and subject choice based on the study issue and settings based on the self-selection pattern by approaching the educator delegate as a facilitator in educational activities via WhatsApp.

**Table 1**
Summary of teacher’s responses

<table>
<thead>
<tr>
<th>No</th>
<th>Name</th>
<th>Summary of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Teacher of Social studies grade V</td>
<td>Face to face style must be used as a companion language for classroom interaction because the class is more interactive, and the learning process is more effective even though my written assignments use TPACK based HOTS. The teacher should save the local wisdom of the Blitar area so that it can be preserved. Even though TPACK based HOTS is my primary reference in-class interaction, I still use face to face styles as an alternative teaching technique of instruction because children are more familiar if I communicate, but when on line activities I use TPACK based HOTS because it is easier to apply, it is better for the teacher to use TPACK based HOTS in class interactions because the students pay more attention. I prefer to use Blitar TPACK based HOTS in-class interaction because I can develop the continuity of knowledge from around the world and children understand better, but when teaching to use face to face styles, and I think teachers should do more reading and need more time to prove the answer so that the continuity of new knowledge will be lower. In class, I use TPACK based HOTS almost in all communication, but sometimes I use a little face to face styles to clarify the case if students still don’t understand. I think all teachers in Blitar must apply TPACK based HOTS in class interaction to live with COVID situation. I prefer to use TPACK based HOTS rather than face to face styles because the class is more lively and children understand the material more in online interactions.</td>
</tr>
</tbody>
</table>

Then the authors choose Two teachers of Social studies and all subjects were grade V and VI teachers. Those two selected teachers who have the habit of teaching using face to face teaching style in the classroom were chosen from the initial observation before the study conducted one week before the data collection done by asking the question concerned and some students taught in their class discussion of participants. The context (i.e., where the investigation will actually happen), the performers (i.e., who will be identified or interrogated), the actions (i.e., what the actors will be noticed or questioned practicing), and the procedures (i.e., what the actors will be discovered or quizzed undertaking) are all possible components of the site (Maxwell & Chmiel, 2014). The authors then move ahead with communication and cooperation with the teacher as the first sequence in the survey initiation, providing data related to the designs in the investigation and introducing the subject area as a teacher’s template to implement in the learning process so that teachers do not face difficulty in processes linked in the learning experience. After the teachers have conducted the learning process, the authors begin...
distributing interview sheets for the data collection process. When the interview is finished, the outcomes are delivered to the writers. The second phase is to organize the data collected by classifying it according to the research questions to communicate in accordance with the research objectives, so that the researcher can easily use the compilation of responses as an evidence of the analysis of the scientific findings, as follows:

### Table 2
Summary of Research Questions and Responses

<table>
<thead>
<tr>
<th>No</th>
<th>Research Questions</th>
<th>Interview Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Can TPACK based on HOTS in social studies in elementary schools help to solve problems that occur in less effective teaching patterns in the current new normal?</td>
<td>Teachers use the face to face styles as a companion of TPACK based on HOTS in the class circle, but in on line learning commands, they still use TPACK based on HOTS to help students to comprehend the case. Moreover, teachers prefer to use a new term of technology to interact because it is more effective teaching patterns in the current new normal situation.</td>
</tr>
<tr>
<td>2</td>
<td>Why is face to face teaching still the leading choice in the class interactions?</td>
<td>Face to face styles is still the teacher’s choice as a TPACK based on HOTS to interact with students in class, especially in Pandemic situation because students are more pleasant and more happy which students habit of using manual activities in their daily lives.</td>
</tr>
</tbody>
</table>

After describing the responses to each research question, and then how they could be based on the primary concern or issue or hypothesis of the research (Bassey, 1999). The results of the interview can be illustrated that the two teachers tend to use TPACK based on HOTS as a new term of teaching styles for class interaction because students understand more deeply and the class is more active, and in applying assignments all teachers use both TPACK based on HOTS and face to face styles to give deep information to students. Some teachers agree that TPACK based on HOTS can be functioned as both a companion of face to face styles in-class interactions and an additional case explanation. Besides, they can preserve the Blitar face to face styles as their local wisdom in class interaction. The results of this finding can be compared by some findings of other linguists as follows: 1) TPACK competence is needed by social study teachers to create learning intelligent and creative, because the field of study social study emphasizes more on aspects of knowledge, facts and concepts that are rote (Rahmatullah et al., 2021); and 2) The results of this research provide guidance and choices for using the TPACK prototype in the Language classrooms. In the upcoming, it will give benefits for improving the quality of English instructors’ professional growth (Drajati, Tan, Haryati, Rochsantiningsih, & Zainnuri, 2018).

### Discussion

The research findings from data analysis are: 1) saving the continuity of face to face styles in teaching as local wisdom, even though TPACK based on HOTS also dominates in learning due to national policies in COVID 19 pandemic situation; 2) although class interaction uses TPACK based on HOTS, teachers use face to face styles to clarify the difficulties; 3) face to face style sin teaching as local wisdom is still a part choice used as a companion class interaction between teachers and students more lively and students are quick to understand the material if explained using both of them. the teacher considers it to be an effective way to have a good interaction in teaching in today phenomena. Besides, students are more familiar with the material and more familiar with new information from around the world. Preview research finding concluded that a TPACK platform based on literacy and high order thinking skill has a pretest and posttest accomplishment significance of 0.001, indicating that literacy based TPACK concept and high order thinking skill impact the effectiveness of the Injob Teacher Professional Educational Program classroom instruction as the undergraduate experience. The TPACK paradigm is based on literacy, and high order thinking skills are taught (Hartati et al.), highlights the importance of developing conceptual
understanding and practice in pre-service instructors’ technology development in education (Altun, 2019). The benefits of this research finding are that teachers and students will get used to applying TPACK based on HOTS as a companion of face to face styles in teaching both in-class interactions and in daily life so that students will understand the learning material clearly because they are more comfortable and the class will be more attractive and interesting.

**Conclusion**

The use of TPACK based on HOTS as the leading choice to be used in classroom interactions. Again, class interaction will be more exciting, and interactive because children will be more active in contacting with the teacher and his classmates in on line learning. Although the teachers use TPACK based on HOTS as the primary style in teaching to clarify the material, they still use face to face technique as a companion. Therefore, it is expected that all elementary teachers in Blitar especially always use the TPACK based on HOTS as a main choice to interact with students in new normal situation. In consequence, the learning goals can be achieved under the teaching objectives, and this step will even help to preserve and maintain the teacher styles in teaching and can develop and follow a new term of teaching technique to adapt in new normal situation.

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