

Investigating the Construction of Learning Activity Types Crafted by Teachers in Teaching Literacy Using TPACK as a Conceptual Model

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Abstract—Although many researchers have been conducted studies on the integration of technology, still there is a lack of empirical research on how teachers construct the learning activity types and practices into a specific subject. To fill this gap, this study explores the fluid development of teachers' TPACK in teaching literacy to fourth-grade students. Literacy lesson in this study encompasses traditional literacy such as reading and writing in which English is used language of instruction. The framework of technological, pedagogical, and content knowledge (TPACK) has been adopted as the basic theory in this study. Thus, this study presents a descriptive case study to dig insightful data taken from two teachers who teach literacy to the fourth-grade classroom. The interview and observations were used to explore the teachers' perception of the integration of technology and to observe the learning activities crafted by teachers in their classroom. The results indicate that teachers were used technology to build and lead the students' understanding about the topic of inquiry, composing the multimodal text, and facilitating the students' multimodal meaning-making. It is hoped that the result of this research would give a shred of knowledge, particularly for elementary teachers, to design a useful lesson with the integration of technology.

Keywords: English language, learning activity types, teaching literacy, TPACK

I. INTRODUCTION

The technology innovation brings about a massive transformation in the education context, which opens up a new area of knowledge that should be developed. As technology is used widely, teachers should be able to integrate technology into the school environment [1]. Teachers should make improvements by integrating technology such as digital mobile devices to refresh obsolete teaching methodologies with innovative strategies [2]. Concerning the field of teaching literacy, ICT allows more opportunities for teachers to design creative ideas effectively with various challenging learning activities for students. Literacy teaching in this study encompasses traditional literacy, which focuses on reading, and writing skills in teaching English to elementary students in an international school with

using English as the language of instruction and fully supported through technology.

This study was rooted through the idea of Shullman in which he presents pedagogical and content knowledge (PCK) to characterize the knowledge needed by the teacher to teach effectively [3]. Further, this idea is developed by Koehler into TPACK (Technological Pedagogical Content Knowledge), [4], [5]. It covers the pedagogical knowledge (PK), the subject matter knowledge (CK), and the technological knowledge (TK). Besides that, TPACK framework consists of the knowledge on pedagogical practice and the content (PCK), the knowledge of technological and content (TCK), the knowledge of the technological and pedagogical practice (TPK), and the knowledge on how to integrate the whole elements of TPACK and the intersection among them (TK, PK, CK, TPK, TCK, and PCK). Teachers can use this framework to crafted well the technology integration into their lesson. However, the success of technology integration is better designed by taking into account students' needs for content-related learning and interests, mainly by choosing and using technologies to support curriculum-based learning. Teachers should be aware of the various potential types of learning activities within a specific subject area [6]. It can be said that learning activities in the classroom should be designed by considering learning activity types with a specific lesson or topic that enables the students to improve their competencies. Furthermore, concerning literacy as one of the essential component in 21st-century learning, the teachers as the main actor in the classroom have to aware to develop activities in the classroom that enables the students to improve their literacy skills. This study aims to investigate how the teachers craft practical learning activities in a literacy lesson supported by rich technology environment. Thus, this study focused on answering the following research questions:

1. How do the teachers perceive technology integration in teaching literacy to fourth-grade students?

2. How do the teachers construct and reconstruct an effective learning activity through the integration of technology using TPACK as a conceptual framework?

II. METHOD

2.1 Study Context

This study had been conducted from October 2019 to April 2020 in one international primary school, which located in Semarang, Jawa Tengah, Indonesia. This research was conducted in this school because of some considerations. First, this school implements an international standardization, which aims to provide the highest standards of education. This school supports the integration of technology by evolving digital learning environment as efforts to enhance knowledge, abilities, and comprehension of teachers' professionalism and the students' achievement. Second, this school has a severe concern toward literacy teaching. Literacy teaching is part of the curriculum and it is implemented as one of the core subject which focuses on reading and writing with English as language of instruction. Third, the authors have granted entry access to collect the data in this school. Thus, this study implemented a case study to portray the teachers' perception and their teaching practice in the teaching literacy lesson to fourth-grade students [7].

2.2 Participants

The participants in this study were an expatriate teacher who had ten years of teaching experience and an Indonesian teacher who had five years of teaching experience. Both participants are teachers who taught the same class in the fourth grade. The expatriate teacher is the primary teacher in the fourth-grade classroom, while the Indonesian teacher as co-teacher. In this research, the school principal's approval was addressed first before gathering the data. After getting the approval, the meeting with the school management was scheduled to inform about the study details and arranged the schedule to meet both expatriates and local teachers in person. The participants in this study were briefed on the details of the purpose of the study. The participant information sheet and consent form were given to the participants. The consent form was also provided research ethics and permission to record lessons to observe how they teach English.

Table 1. The Participants' Information

Pseudonym	Teaching Experience	Gender	Grade Level	Class room size
Catherine	10 years	Female	4	13
Juwita	5 years	Female	4	13

2.3 Data Collection Procedure

The instruments used in this study were semi-structured interview, observation, and video-recordings. During collecting the data, the interviews were scheduled based on the teachers' agreement and teachers' time availability. Interviews aimed to probe teachers' perception in integrating technology in literacy lesson in their classroom. The focus of the interview is presented in Table 2. Classroom observation was another significant source used in this analysis. Therefore, the classroom observation checklist was used to collect information in the literacy lesson. In each literacy subject, the class was observed for one 90-minute. It was conducted based on the agreement of the time availability of teachers. In order to focus on detail supporting the core research subjects, observational guidelines in the classroom based on TPACK domains were created. Thus, during the classroom observation, the teachers were asked for permission to record classroom activities that mirrored TPACK domains.

Table 2. Interview Protocol

Domains	Questions
Literacy-technology Enhanced Learning	<ol style="list-style-type: none"> 1) How do you draw out the students' initial concept while learning new knowledge in literacy lesson? 2) How do you build the students' understanding of preparing them in writing or reading a task? 3) What technologies do you use to support students in constructing ideas?

III. RESULT AND DISCUSSIONS

3.1 Teachers' Perception of the Integration of Technology in Literacy Teaching

Both teachers were interviewed to investigate their perception of the integration of technology into literacy teaching in their classroom. Based on the result, the teachers were used technology to enrich the students' ideas and creativities during the completion of the task given by teachers.

The excerpt:

"We create a digital learning culture which aims to enhance all knowledge and skills. Technology is used as a chance for students to become knowledge creators and to help them to **develop** their writing skills such as adding a picture, sounds, and materials as well as reading skills through technology applications and websites provided in their laptop and iPads."

Based on the result, the teachers were used technology to enhance the students' literacy competencies as a tool to build the students' understanding to prepare for a writing task, leading the students in composing the multimodal text, and supporting the students' independent construction of the multimodal text. In this case, technologies are used to enrich the students content reproduction, learn, and do research to fulfil writing task given by teachers. The use of technology in teaching literacy help the teachers make the students successful in learning. However, based on the interviews, the teachers suggested not to use technology for the whole time of classroom activity. The skills such as handwriting cannot be abandoned concerning the students are still in the age of young learners. The students should be equipped both in digitally and non-digitally learning activities. Besides, the core components of teaching, such as technological, pedagogical, and content knowledge (TPACK) should be considered carefully. How well the teachers construct their teaching and learning with technology integration as learning media will affect the student learning experiences. Therefore, teachers must have knowledge in using technology in order to be able to teach more effectively [8].

3.2. The Learning Activity Types Construct by Teachers in Literacy Lesson

The participants were interviewed to elaborate further information about their beliefs and perception toward their teaching strategies in a literacy lesson. The result of the interview was also juxtaposed with the camera-ready video-recorded which assembled before class starts and an observation checklist notes to portray every single teachers' activities in the classroom. The results showed that sharing sessions have a role as a pre-teaching activity to draw out the students' initial concept at the beginning of the lesson. In sharing activities, teachers lead the students' initial concept through guided questions, discussions, and friends/peer feedback. The excerpt is taken from the interview below:

The excerpt:

"As a **pre-lesson activity**, we were sitting together on the mat, and I asked the students to take in turns with a time of allocation 2 minutes maximum per child **to share** about their weekend. While listening to others, the students must think carefully about what the others are saying and then ask questions that are relevant to what others sharing or retell what others share "".

Sharing sessions were used to enhance the student's ability to convey their opinions with clarity and details. In this case, teachers have a significant role in building the students' attention and interest to learn. Thus, pedagogical aspect is strongly needed in order to tackle the students' mental development process, because when the teachers lose the students'

attention on first five minutes teaching means the teachers would probably lose the whole students' attention during class. Besides, the teachers used grouping in each lesson to differentiated learning. On the video-recorded camera can be seen that Catherine and Juwita began the activity by splitting the class into smaller group and reminds the students to work in-group. Differentiated learning means the teachers facilitate the students to learn based on their capability. The teachers believe it was useful to provide all the students characteristics and meet their learning needs. Each student is assigned to take different roles that attain learning needs. The role of technology in this stage was to help the students' to develop their ideas and extend understanding by recalling and discussing important features of talk in-group in particular topics using laptop and iPads. The excerpt is taken from the interview below:

"We implement **differentiated learning** or **composite classroom** as obligations of our school. The class is drawn based on the students' individual needs. The students are more confident and independent ."

In differentiated learning, the teachers should understand what students' need, students' interest, and their learning readiness. Hence, the pedagogical knowledge is essential to navigate an appropriate learning instruction to the students with different learning background and also to maintain the learning gaps that might occur among the students who have different characteristics, different competencies and different learning level. During the lessons, the teachers also engaged students with feedback activities in which it aimed to evaluate the learning provided.

The excerpt:

"We have **reviewing activities** and **feedback sessions** in our lesson. It is useful to maintain and review the curriculum unit and discuss what the students covered on learning. This approach is what we meant by making **learning visible**."

On reviewing activities, the students acquire the learning process of what it called as visible learning. The students who have different activities on the different group have chances to share what they learn during the lesson and communicate with the other groups. Thus, the students will learn knowledge from another learning experience, and it preceded a new experience for the students. However, teachers cannot count on technology without sufficient competence in pedagogical skills. Pedagogical knowledge cannot be separated as an integral part of teaching using technology [9]. Lack of pedagogical knowledge will cause some difficulties in choosing appropriate ways to blend technologies that fit certain pedagogical practices [10].

Furthermore, in relation to literacy, literacy expectations were not addressed to the students'

ability to read and write, but it further addressed to the students' multi-literacy capability, which covered the fundamental skills to comprehend idea and information as well as a symbol, and multimedia in range of contexts. The availability of various kinds of technology does not guarantee that students can learn well; however, teacher's ability to use certain technologies to make students succeed is more important. In this study, the students' literation process is preceded through teachers' encouragement to build and facilitate students about the topic of inquiry. By grouping activities and differentiated learning, students develop their writing through "independent trial and error" through input from their peers.

The teachers and the students' in-class writing activities were elaborated in Table 3. The information on table 3 shows the sample of teaching organization in teaching literacy to fourth-grade students.

Table 3. Teacher and Students in-class activities

Topic: "Taking the Shelter"		
Teachers' Activity	Students' Activities	Compatible Technology, websites, application
Brainstorming: Showing a picture of Orang Utan, introduce and brainstorm the students' knowledge based on the picture, giving information on the language structure of the text	Identifying and think about the environment of the <i>Orang Utan</i> and why he needs to "take shelter."	Individual iPads/computer, smartboard, websites (www.pobbl.com), Google docs, Seesaw
Grouping: Inviting students to work in the group	Working in groups, taking notes, and making a plan for their story, adding in two pictures	
Write an essay: Motivating and guiding students to write an essay by giving a mentor text, such as giving the student knowledge on figurative language to evoke an imaginative response in their writing	Writing new scenes or characters into a story or write from another viewpoint, attempting to establish a link between paragraph using adverbials Choosing words, phrases carefully using figurative language	
Giving feedback and conducting an evaluation	Reporting what went well and evaluating their writing, what did not go well	

This process of teaching was in line with the taxonomy on TPACK-related activity types developed by Harris and Hofer, which connect the content-driven pedagogical strategies with specific and compatible technologies [5a]. Meaningful

learning of technology-based teaching could be achieved by providing pedagogical dimensions that involve active learning [11]. Also, teachers' awareness of ICT integration is recognized as being in a high sensitivity to pedagogies linked to specific topics [12]. The example of teachers-students in-class activities based on observation is presented on the table 3:

The ability of teachers to design an effective lesson plan will affect the success or failure of teaching on technology integration [13]. The creativity of teachers as designers to carefully choosing and using specific technological tools are the successes of technological integration in respect of technology, pedagogy, and subject matter [14]. Therefore, the main components of TPACK, new technologies and related pedagogies need to emerge in order to improve student learning and success [15]. Besides, factors such as school environment, principal' commitment, infrastructure, and awareness to develop professionals are one of the situational and contextual factors that also influenced the way teachers design their lesson [16]. In response to this, it would be beneficial for teacher education to encourage teachers' own beliefs to achieve efficient technology integration [16a].

IV. CONCLUSIONS

As TPACK are not restricted to a single teaching method, teachers must construct their TPACK-based learning or even technology integration to accommodate the full range of teaching methods, curriculum demand, and students' learning styles. The construction of students' learning activity types using technology should consider the heuristic part of teaching process. Thus, teachers' professional justification, which underpinned the teachers' decision in making the construction of the instructional design, should accommodate the component of pedagogical, content, and technological knowledge comprehensively to teaching successfully.

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