Technological Pedagogical Content Knowledge (TPACK) to Enhance the 21 st Century Skills in History Learning

Afrida Eka Wulandari
afridaekawulandr@gmail.com
Universitas Pendidikan Indonesia

Abstract: This research aims to obtain information and analyze TPACK (Technological Pedagogical Content Knowledge to enhance 21st-century skills which in this study refers to the 4C (critical thinking, communication, creativity, and collaboration) in history learning. TPACK framework aims to provide an overview of teaching and learning that is integrated with technology to improve students' knowledge which supports 21st-century skills. This research used a literature study method contained in journals, books, and other scientific works. The collection of data information is made by collecting library data, reading, writing, and processing research materials. The results of the discussion are teaching 21st-century skills can be enhanced by using the TPACK learning approach which is integrated.

Keywords: TPACK, 21st-Century Skills, History Learning

Introduction

The development of technology causes changes in the values of society. The new values created by technological developments are called industry 4.0 and society 5.0. The term Industry 4.0 comes from a project initiated by the German government to promote the computerization of manufacturing. The Industrial Revolution 4.0 itself occurred around the 2010s through intelligence engineering and the internet of things (IoT) as the backbone of the movement and connectivity of humans and machines (Shwab, 2016:60). The state of the people who are present in industry 4.0 is represented as society 5.0, which means that technology has become part of people's lives. Revolution 4.0 and society 5.0 fundamentally change the way people live, think, and relate to one another. This era will disrupt various human activities in various fields, not only in the field of technology but also in other such as economics, society, politics, and of course, which also undergo major changes in education.

Education in the era of society 5.0 is related to changes in the learning system and human resources in education must be sensitive in dealing with changes in the era of society 5.0. This revolutionary era is closely related to 21st-century skills. Trilling and Fadel (2009:48) formulate 21st-century skills into 3 parts, namely: (1) learning and innovation skills; (2) information, media, and technology skills; (3) life and career skills. Four types of 21st-century skills were socialized by the Director General of Primary and Secondary Education of the Ministry of Education and Culture (2017) that are needed to adapt, known as 4Cs, namely: (1)critical thinking and problem-solving skills; (2) communication skills; (3) creativity and innovation; (4) collaboration.

4C are soft skills which in their daily implementation are much more useful than mastering hard skills only. In the implementation of education and teaching, apart from teaching hard skills must also train the soft skills learning especially 4C skills which are necessary for the 4.0 revolution era of society 5.0 in the 21st century. Another opinion related to 21st-century skills was conveyed by NEA (2002:7) which needs to be prepared for students, namely critical thinking, communication, collaboration, and creativity.

The pedagogical strategy to empower 4C skills is to utilize technology to create a richer learning environment and to build 21st-century skills. The strategy is to (1) become technology-aware and literate; (2) assign problems that occur in the real world for students to be solved using technology; and (3) create a collaborative problem-based learning experience using resources obtained through the internet. Thus, the main domains of 21st-century skills in the form of digital literacy, intensive thinking, effective communication, high productivity, and spiritual and moral values can be achieved through continuous exercises in the learning process (Zubaidah, 2018:16).

Learning competence of 21st-century skills can be done using the TPACK (Technological Pedagogical Content Knowledge) learning approach. Teachers who master the TPACK skills will create more effective learning (Hong,2018:1664; Etzkorn,2018:29). TPACK can integrate pedagogic, content, and technology elements in history learning. Learning history using the TPACK approach needs to be maximized by educators when implementing it so that it can achieve learning objectives and students have sufficient skills to face the 21st century. TPACK is the knowledge that every teacher must possess to succeed in integrating technology into their learning (Kereluik, 2011:12). Integrating TPACK is one of the innovative learning methods to improve students' abilities. This article aims to describe TPACK to improve 21st-century students' abilities, especially in learning history.

Methods and Research Design

This study used the literature study method. A literature study is a research conducted by researchers by collecting many books, studies related to the problem, and research objectives (Danial, 2009:80). Researchers collect information by analyzing various theories from various research that have been carried out to make conclusions about TPACK to improve 21st-century skills.

Results and Discussion

Technological Pedagogical Content Knowledge (TPACK) became popular with

the 2006 article by Milik Mishra and Matthew J. Koehler in the Teacher College Record Journal. The basis of the TPACK framework is the complex interaction of three main forms of knowledge, namely technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK). The result of the combination of these 3 basic knowledge produces 4 new pieces of knowledge, including pedagogical content knowledge (PCK), technological content knowledge (TCK), technological pedagogical knowledge (TPK), and technological pedagogical content knowledge (TPACK).

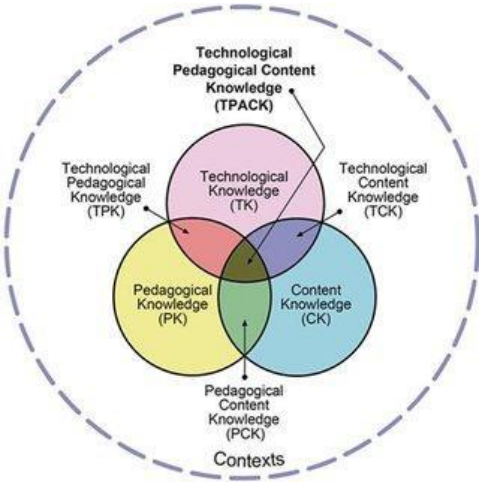

Figure 1. TPACK Framework (Source: http://matt-koehler.com/tpack2/tpack-explained/)

Schmid (2020:2) defines the three main bits of knowledge as follows: (1) technological knowledge (TK) is knowledge about technology and how to operate it, a teacher must have the ability to master technology ranging from low technology such as books and blackboards to mastering technology. digital services such as the internet, software, digital literacy, and digital video; (2) pedagogical knowledge (PK) is knowledge about processes and practices or learning methods that include learning objectives, values, and educational objectives, such as learning processes, classroom management, and implementation of lesson plans; and (3) content knowledge (CT) is knowledge

about the actual subject matter to be taught, including concepts, theories, and procedures. TPACK-oriented learning facilitates students by using technology that can assist students in learning, presenting material content with technology, making it easier for students to communicate various things regarding learning materials (Mishra, 2006:1046).

Today's learning is prepared to develop student's skills to face the 21st century. The 21st-century skills that need to be developed as a provision for students are critical thinking, communication, creativity, and collaboration, known as 4C. Critical thinking is the ability to systematically evaluate the personal opinions and the opinions of others to achieve deep understanding (Johnson, 2009: 182). Through critical thinking skills, students are expected to be able to have a way of thinking to make effective reasons, solve problems, calculate possibilities, make conclusions, and make decisions. Concerning critical thinking, history learning has begun to be able to give hope to contribute to 21st-century knowledge. The teacher-centered using the lecture model has begun to be abandoned, and many learning models have begun to be adapted for more modern history learning, namely integrating technology in it. Students are encouraged to no longer be fixated on textbooks, but to involve technology to answer historical material questions that can encourage students' critical thinking and make discoveries. Through that historical learning, knowledge about various technologies or technological knowledge (TK) ranging from simple technology to digital technology can not only encourage critical thinking but also encourage students' ability to adapt and learn new technologies.

The development of students' critical thinking skills can be seen in their communication skills (Mursidah, 2019:1074). Communication skills in the 21st century are very important. The main skills that are closely related to communication skills are converting information and solving problems through language. In addition, the ability of students to assess, analyze and synthesize information in communication is no less important. Communication skills refer to an individual's ability to communicate clearly, use spoken or written language, verbally and non-verbally, and collaborate effectively (Pacific Policy Research

Center, 2010:6). Students' communication skills can be seen when they can communicate ideas or information they have learned orally (Ichsan, 2020: 2). The relationship between these two skills is when students can convey ideas or ideas through discussion showing their ability to think critically.

Creativity has been considered one of the important skills that must be mastered and are the key to effective learning in the 21st century. Creativity has been noted as a significant skill throughout the life span (Egan, 2017:21). Creativity skills are synonymous with the ability to generate new ideas (Piaw, 2010:1). Creativity skills need to be applied to students so that they can get used to being open and responsive in finding or conveying new ideas, ideas, or opinions to others. Students' creativity can be observed when students can solve new problems given by using new ideas or information and can analyze these problems by utilizing technology (Laar, 2020: 3). Activities in history learning that can trigger students' creative abilities which is most often common is presentation. Presentations can not only trigger communication skills but also trigger students' creative abilities by designing the technological media used. Media can be in the form of PowerPoint presentations, posters, pamphlets, videos, and so on to attract the attention of other students.

Collaboration is a 21st-century learning trend that shifts teacher-centered learning to collaborative learning. Students must also develop collaboration skills which can be seen from the ability to work together in groups of two or more people to achieve common goals, respecting each other's contributions (Roberts, 2004:205). Collaboration is a skill that aims to develop collective intelligence in terms of helping, suggesting, accepting, and negotiating through interactions with others mediated by technology (Brown, 2015:61). Collaboration skills can occur in the process of mutual learning and can complement the shortcomings with the advantages possessed by other members so that the problems faced can be resolved properly and achieve common goals in an atmosphere of togetherness.

In designing TPACK learning tools to improve 21st-century skills through history learning, teachers' understanding is needed to change various forms of

TPACK and their contextual knowledge into a well-integrated ICT-integrated learning design. In the first stage, activities to develop an understanding of TPACK content (CK, PK, TK, PCK, TCK, TPK, TPACK) for example in the field of knowledge about history learning materials, history teachers explore the curriculum and use various technologies to teach different topics in the curriculum. To improve 21st-century skills in history learning in addition to integrating pedagogic, content, and technology elements (TPACK) students must be required to be active in learning activities, express opinions, work together in groups, and be creative in utilizing internet technology in learning.

Discussion and Recommendations

21st-century learning forces every teacher, especially history teachers, to be able to transform by integrating technology and 21st-century skills into learning that can develop critical thinking and problem-solving skills, train creativity, build collaboration through collaboration and leadership, and practice communication skills. 21st-century skills (critical thinking, communication, collaboration, and creativity) are one of the expected outcomes for each student. TPACK can develop themselves and innovate in learning for educators. Integrating TPACK can help solve student problems, and foster effective learning that is focused on students so that it is easier to understand the content contained in the history learning curriculum. History learning, which was originally synonymous with memorizing the chronology of the past, needs to be transformed by involving students to actively observe current issues, criticize and associate events between the past, and present, and predict the future.

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