

Application of TPACK (Tecnological Pedagogical Content Knowledge) in Accounting Subjects at Vocational High School (SMK) Batik 1 Surakarta

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Abstract

The purpose of this study was to determine the application of Technological Pedagogical Content Knowledge (TPACK) at SMK Batik 1 Surakarta. The main components of TPACK consist of Pedagogical Knowledge (PK), Content Knowledge (CK) and Technology Knowledge (TK). The type of method used in this research is case study research with a qualitative approach. The subjects of this research are accounting subject teachers, and three students from class XI accounting. Data collection techniques were conducted through interviews, observation, and documentation. Data analysis techniques were carried out through reduction, presentation, and conclusion drawing. The results showed the application of TPACK using learning media: (1) Videos made using applications or adjusting to accounting subjects. (2) The application of learning with e-learning (google classroom) starting during the COVID-19 pandemic was used during learning to deliver Flipbook teaching materials or Quizizz in the form of information technology in the form of a website that can be accessed anywhere. Based on the research conducted, there are several researchers who also discuss or review this research.

Keywords: TPACK; Learning Media; Covid-19 Pandemic

Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui penerapan Tecnological Pedagogical Content Knowledge (TPACK) di SMK Batik 1 Surakarta. Komponen utama TPACK terdiri dari Pedagogical Knowledge (PK), Content Knowledge (CK) dan Technology Knowledge (TK). Jenis metode yang digunakan dalam penelitian ini adalah penelitian studi kasus dengan pendekatan kualitatif. Subjek penelitian ini yaitu guru mata pelajaran akuntansi, dan tiga peserta didik dari kelas XI akuntansi. Teknik pengumpulan data dilakukan melalui wawancara, observasi, dan dokumentasi. Teknik analisis data dilakukan melalui reduksi, penyajian, dan penarikan kesimpulan. Hasil penelitian menunjukkan penerapan TPACK menggunakan media pembelajaran: (1) Video yang dibuat menggunakan aplikasi atau menyesuaikan pada mata pelajaran akuntansi. (2) Penerapan pembelajaran dengan e-learning (google classroom) diawali pada masa pandemi COVID-19 digunakan saat pembelajaran untuk penyampaian Flipbook bahan ajar atau Quizizz bentuk teknologi informasi berupa website yang dapat diakses dimana saja. Berdasarkan penelitian yang dilakukan, terdapat beberapa peneliti yang juga membahas atau mengkaji penelitian ini.

Kata Kunci: TPACK; Media Pembelajaran; Pandemi Covid-19

Introduction

TPACK is a learning method that is a combination of 3 main aspects, namely Pedagogical Knowledge (PK) which relates to the theory and practice of teaching and learning of teachers, which includes goals, processes, learning methods assessment and others. Teachers understand deeply and focus on the pedagogy needed, namely how students understand and construct knowledge, attitudes and skills. The model of integrating technology in learning is called Technological Pedagogical Content Knowledge (TPACK) which can help teachers in understanding the application of technology in accordance with learning content and techniques (Baran et al., 2011). TPACK is a learning framework that integrates technological knowledge, content knowledge, and pedagogical knowledge in a specific learning context (Oktaviana, 2021). What exactly is educational technology? It is important to define educational technology given its pivotal role in the current era of globalization of education. However, to avoid overlapping understandings, social scientists and technocrats have different understandings of the term technology. The important difference that occurs in the term technology is in its application in the realm of technicians and the realm of social science and applied social science (Haryanto, 2015).

The ability to use technology is not enough. Therefore, in learning, teachers must also have the ability to master content, materials, pedagogy, and others. TPACK is known as a theoretical framework to understand teachers' knowledge in using technology in the learning process effectively. Knowledge of pedagogy, technology and content knowledge are basic competencies that must be mastered by teachers in the second century (Ajizah & Huda, 2020). Content Knowledge (CK) according to notes that the subject matter includes knowledge in the form of concepts, theories, ideas, frameworks, methods equipped with scientific methods and their application in everyday life. Technological Knowledge (TK) is the basics of technology that can be used to support learning. For example, the use of software, animation programs, internet access. Basic knowledge, knowledge of technology in using it to support the understanding of the subject matter being studied. To support the facility of teaching and learning activities, students are in dire need of technology enhancement to develop subject matter. In this way, teachers can understand the teaching material with the components of the form of mastery of technology during the learning process of facilitators who guide students to learn more effectively. The rapid advancement of information technology makes teachers have to master technology to be used as a supporting medium in learning activities. Furthermore, when information and communication technology develops very quickly and begins to enter schools evenly, and children are getting used to using information and communication technology in their daily lives, it is time for teachers to start applying information and communication technology in their learning (Gunanto & Supriyadi, 2021).

The presence of TPACK marks a new era and process of progress in the world of education. TPACK summarizes the various skills needs of educators in the era of modernization. Technology, pedagogy, and content mastery are the main elements in TPACK. Educators who are able to master TPACK and integrate it with learning will present a different combination of opinions from educators who are not yet able to master TPACK (Rahmadi, 2019). The increasingly rapid advances in technology should be accompanied by the ability to estimate the efficiency and accuracy of learning methods so that learning objectives can be achieved (Abdul Quddus, 2019). Teachers have an important role in developing students' potential and talent (Baharuddin & Palerangi, 2020).

Capabilities in information and communication technology have an important role in improving and supporting the learning process (Budiman, 2017). It is said that learning is balanced if a teacher masters two types of knowledge in providing teaching to students, namely knowledge of subject matter and knowledge of pedagogy. Contained in Minister of Education and Culture Regulation Number 22 of 2013 regarding the learning of the 2013 Curriculum against the process standards used, it is stated that the relevant 2013 Curriculum has two principles of learning with global developments, namely the use of communication and information technology to increase the effectiveness and efficiency of learning, various learning resources that must be available, and multimedia-based learning resources and learning media because nowadays it is called the digital era (Subhan, 2020).

The problem currently being faced by Indonesia is the low quality of education. This is caused by a lack of public awareness of the importance of education and the limited role of the government in improving educational standards. Education has a vital role as a reflection of the quality of a nation, because through education, values can be internalized and the ability to shape the personality and character of a nation can be realized. Special skills are needed by teachers in school learning regarding the use of technology. The material that teachers will teach students must be able to choose the right technology to use. Not only must they master technology well, but teachers must also be able to choose learning strategies, knowledge of teaching materials and pedagogy. So this is where Technological Pedagogical Content Knowledge (TPACK) is formed from these three knowledge (Amrina et al., 2022).

Teachers who have good competence will have self-confidence which can improve good performance in learning. These competencies are obtained by teachers while studying at university through learning experiences and training activities (Julia et al., 2020). (Yurinda & Widayasar., 2022) stated that in order to produce a satisfactory learning outcome process, teachers must be standardized in mastering technology because it is adjusted to the quality of education in Indonesia. Thus, the skills of each teacher are not only seen from technology alone, but must develop pedagogical abilities and material content in learning in this digital era. Therefore, this research aims to find out how the implementation of TPACK on teaching skills in schools. A teacher using technology in learning can Facilitate the delivery of abstract material to be easily understood by students (Maeng, 2013). Teachers' ability to achieve teaching success is not only influenced by their expertise, the motivation they provide, students' active participation in the learning process, as well as the availability of facilities and conditions of the learning environment. A factor that also plays an important role is the teacher's ability to develop various teaching skills with technology. It is not enough for 21st century teachers to have knowledge about the material being taught and how to teach it. The latest developments in science, technology, and art in the field of education, require teachers to also have knowledge about technology and its use in learning and learning (Koyuncuoglu, 2021). 21st century teachers must have both knowledge and skills in using various technological devices both traditional and modern to facilitate learning and improve learning outcomes (Fajero et al., 2021).

The results of an interview with the Accounting Teacher at SMK Batik 1 Surakarta stated that SMK Batik 1 Surakarta had long implemented learning using video learning media. The reason why video media is effectively used during learning is because the material is delivered in sound and visual form, so students do not feel bored during learning. In its use, this learning video media will involve the senses of display and sight. The teacher said that videos made using the Canva application, apart from being easy to use, the Canva application also has many free designs online, where there are various

places to make posters, power point presentations, pamphlets, graphics and many others. Apart from the video media used, the teacher's interview results also explained that the SMK Batik 1 Surakarta implemented e-learning (Google Classroom) starting in 2020, which stated that schools were closed due to the Covid-19 pandemic which hit the world, including in Indonesia, and was used until Now. Using Google Classroom which contains internal material in the form of a flip book and there are questions or quizzes that students must complete which can be accessed anywhere but there is a time limit.

The results of interviews with three class XI accounting students found that there was progress in learning felt by the students, in terms of learning models and the media used. Learning carried out by teachers is able to increase students' creativity and understanding in more interesting and relevant learning. Students also said that learning using video and e-learning media (Google Classroom) which included flip book and Quizzizz learning media increased their understanding of the use of technology in the field of education, developing the skills needed in the digital era. As a result, student progress in terms of understanding and learning skills can increase significantly through the application of TPACK learning. Judging from the learning model in the modern era like now, technology-based learning is really necessary, because the current generation sees technological advances as students and girls are able to follow and apply it well.

Method

This research is case study research with a qualitative approach. This qualitative research approach involves important efforts, such as asking questions and procedures, collecting specific data from participants, analyzing data inductively starting from specific themes to general themes, and interpreting the meaning of the data. This research was carried out at SMK Batik 1 Surakarta. The time of the research was carried out September 15 2023. The subjects of this research were 4 (four) people consisting of accounting subject teachers, and three class XI accounting students. The data collection techniques used were interviews, observation and documentation. In-depth interviews with a focus on obtaining information about the application of Technological Pedagogical Content Knowledge (TPACK), including what learning media are used during learning, finding out more about learning media and learning techniques applied by teachers. Observations are carried out by observing the teacher's actions in class, mastery of the material and learning methods used, observing students during learning.

Documentation obtained includes when the teacher taught in class, learning video data, a list of students who successfully implemented learning well at school, a list of student group work. The validity of the research used is triangulation of sources and techniques. The data analysis technique carried out in this research was through a process of data reduction, data presentation and drawing conclusions. At the data reduction stage, it is intended that after the data is obtained, it is drawn in the form of detailed descriptions, then these descriptions are reduced and coded and then selected and focused according to the problem formulation. At the data presentation stage, the researcher created a list of codes in accordance with the interview, observation and documentation guidelines. The data that has been coded is then analyzed and presented in text form. At the conclusion drawing stage, conclusions in qualitative research are new findings that have not previously existed. Conclusions must be able to answer the problem formulation formulated from the start by the researcher

Results and Discussion

The description of the research results is adjusted to the initial research objectives. Based on the results of research that has been carried out, regarding the Application of Technological Pedagogical Content Knowledge (TPACK) at SMK Batik 1 Surakarta, several research results were found, namely:

1. Application of Learning Video



Figure 1. Application of Learning Video

Based on the results of data analysis, the application of learning videos at SMK Batik 1 Surakarta has been conveyed by accounting teachers that they can support more effective and more advanced learning activities in an era of rapidly advancing technology. Video learning media can describe an event related to the subject matter which raises students' understanding of the subject matter. Therefore, the application of video as a learning medium is considered capable of improving student learning outcomes. Apart from using technology as learning media, teachers must also apply various learning methods. These variations in learning methods are intended to increase student participation and activeness in the learning process. Variations in learning methods are also intended to increase student understanding. To be able to create active accounting learning and facilitate student understanding, accounting teachers should apply appropriate learning methods. Variations in the application of learning methods can be done with learning that is engineered into a particular role play to illustrate the learning material.

The accounting teacher at SMK Batik 1 Surakarta also said that the implications of implementing this learning video media are very effective in using it in various subjects, especially subjects that require more concrete and in-depth explanations, such as accounting practices which are discussed with the help of pictures or videos in the presentation. The use of learning video media should be applied appropriately and variedly to overcome students' passive attitudes and attractive appearance with the aim of overcoming students' boredom in the learning process.

Developing learning video media so that the results meet the needs of students requires more skills and time. As stated by the accounting teacher, accounting lessons contain many calculation formulas, so learning videos are proven to be more effective when compared to textbook learning media, but students cannot necessarily understand them themselves and they may not necessarily read them. However, this learning video media is only a tool to help the learning delivery process, therefore the role of education

is needed as an active role as a facilitator so that students continue to play an active role in learning. And learning video media can provide good and useful feedback to students. Video-based learning activities at SMK Batik 1 Surakarta are in accordance with research results (Amril Huda M, Wahdini Anna Filla, 2022) and at Abdurrah Islam Vocational School Pekanbaru also implements video-based learning using the Canva application to follow the progress of changes to the independent curriculum (Yulia Safitri, Ira Hidayati, 2023).

2. Google Classroom

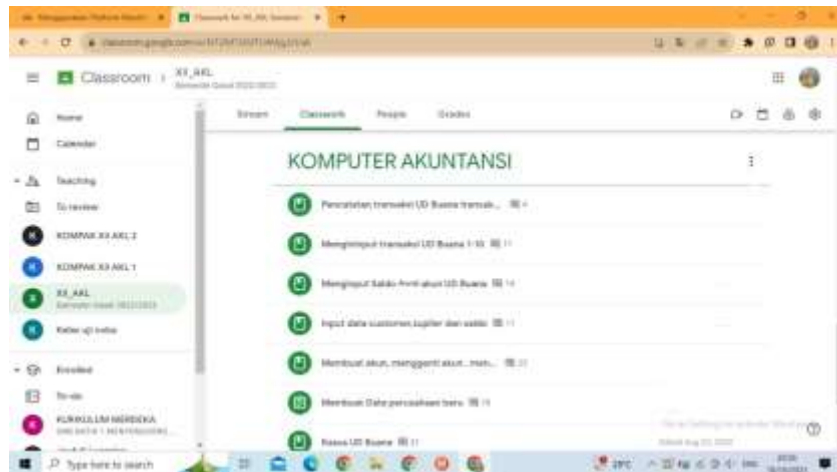


Figure 2. Google Classroom Display

One of the learning models offered is the e-learning innovation model. e-learning or electronic learning is now increasingly recognized as one way to overcome educational problems, both in developed countries and in developing countries. Many people use different terms with e-learning, but in principle e-learning is learning that uses electronic services as a tool (Based on the results of research conducted on accounting teachers at SMK Batik 1 Surakarta, they said that the application of learning media using e-learning (Google Classroom) began during the COVID-19 pandemic which attacked the entire world, including Indonesia, requiring teachers to carry out distance learning because schools were closed. Google Classroom is one of the places used during distance learning and is still used today because teachers feel the ease and effectiveness of using Google Classroom. It becomes easier for teachers to see and check the results of students' assignments without having to carry a lot of paper. Then, it is also easier for students to see the learning results provided by teachers anywhere, because Google Classroom can be accessed anywhere, not only at school but at home too. Google classroom makes data more centralized. So teachers will no longer forget to save student data when students have completed assignments or done quizzes because all data is already stored in their Google account. This can make learning more effective and efficient. Teachers can establish good communication and collaboration with students, because students can upload and ask anything they don't understand, especially the material in the class.

Teachers can also immediately explain when there are students who do not understand during class because usually when learning begins, students are required to read the material on Google Classroom so that when learning in class the teacher and students already understand the material that will be presented. The use of Google Classroom also supports the government's program about going green. This can be seen by reducing the use of paper used in collecting assignments, students type their assignments in Microsoft Word and send them directly to Google Classroom without having to print them. So, indirectly by using Google Classroom we are helping to protect

the environment. The accounting teacher at SMK Batik 1 Surakarta said that teachers and students experienced problems logging into Google Classroom accounts because of their internet connection. This can be resolved by using WiFi from the school, however, this is a reference that requires a good internet connection when we use Google Classroom. So, school facilities must be supported by good internet facilities so that Google Classroom can be used by teachers and students. It is In line with research from (Sihotang, 2019) that implementation E-learning learning media Google Classroom-based can increase learning motivation.

One of the learning materials created into multimedia Flipbook is material to improve students' creative thinking in the learning process. Sometimes teachers as transmitters of information to participants are unable to create an interesting and conducive learning atmosphere. By using the Flipbook learning media, it is also hoped that it can help when teachers present material in class. The accounting teacher at SMK Batik 1 Surakarta said that communication learning, interaction between teachers and students needs to be improved in order to stimulate the expected thinking abilities of students. Teachers must understand technological advances in education to be able to balance technology-based learning. The Flipbook created and used by the accounting teacher at SMK Batik 1 Surakarta during learning is a combination of text, animation, video, sound and so on, thereby providing audio and visual stimuli that will improve students' memory. The use of Flipbook media, apart from being a tool in learning activities, can also bring about changes in students. This is reflected in the effectiveness and enthusiasm of students in participating in learning, and it is concluded that learning using Flipbook in learning activities improves learning outcomes, motivation and attitudes of participants educate.

3. Flipbook



Figure 3. Flipbook Form of Teaching Materials

On Google Classroom, the teacher said that in implementing TPACK-based learning at SMK Batik 1 Surakarta there was also a Quizizz to improve students' understanding of the material that had been presented during the lesson. Quizizz can be accessed anywhere but there are time limits for processing questions such as questions. With the Quizizz application, it also makes it easier for teachers to carry out online assessment activities for several reasons. Ease of creating questions where there are various question options including multiple choice and complete answers and essays. When creating questions, the questions are automatically saved without taking action to save them and the wrong and correct answers are immediately displayed on Quizizz. Thus, teachers must also prepare themselves to face evaluation. The results of the evaluation/assessment are immediately obtained even when students answer each question, so teachers and students can monitor the progress of the scores obtained. Then, after the assessment is complete, the final grades obtained are immediately captured in the Quizizz application which is collaborated with Google Classroom and the grades are also immediately captured in Google Classroom if the teacher has created classroom management with Google Classroom.

4. Quizizz

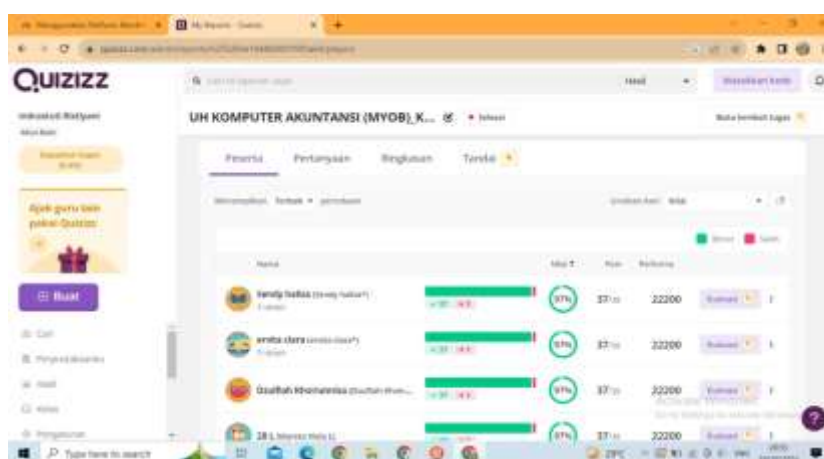


Figure 4. Students' Quizizz Results

The learning media applied by teachers can influence student learning outcomes, the teaching and learning process using learning media produces better learning processes and outcomes than without learning. Based on the research that has been conducted, it can be concluded that there is a positive response from the use of Quizizz learning media on student learning motivation. This increase was influenced by several factors, motivation, providing sufficient material using Quizizz media, training with the questions tested on Quizizz media. Quizizz media is suitable to be applied in learning because it makes it easier for teachers to deliver learning material and conditions students in class.

For students, Quizizz is considered an interesting learning media, because Quizizz media provides a new atmosphere, makes it easier for students to understand learning material and there are several features that increase student motivation. This opinion is in accordance with Zhao's opinion in his research. Using Quizizz in class makes practice fun, helps them review learning material and stimulates their interest in learning (Zhao, 2019). Quizizz can be used as a good and fun learning strategy without losing the essence of ongoing learning. In fact, this strategy can involve active student participation from the start (Noor, 2020).

Application of Technological Pedagogical Content Knowledge (TPACK) in Accounting Subjects at SMK Batik 1 Surakarta, there are several learning media that are

applied, namely learning using learning videos, Google Classroom, Flipbook, and Quizizz. Technological advances in education require teachers and schools to provide adequate learning facilities and infrastructure using technology. Teachers must be able to adapt to this increasingly advanced learning. The accounting teacher at SMK Batik 1 Surakarta said that teachers at SMK Batik 1 Surakarta are obliged to take part in training activities regarding learning progress, especially for young teachers who are very obliged to learn how to learn today. In this era of increasingly advanced technology which is developing very rapidly in the world of education, teaching staff must be able to keep up or balance so that students can take part in learning activities according to advances in the world of education today.

Conclusion

From these results and discussion, it can be concluded that the application of Technological Pedagogical Content Knowledge (TPACK) at SMK Batik 1 Surakarta is carried out through learning video media, Google Classroom, Flipbook, and Quizizz. The use of learning video media is an effective way to convey learning material using audio-visuals and to provide learning experiences to students. By planning to create and integrate videos wisely, teachers can help students understand and master the material well, contributing to students' learning progress and preparing them for a future that is increasingly connected to technology. The videos created produce interesting and innovative learning. The implementation of E-Learning through Google Classroom has brought changes to the world of education starting in 2020 since it was declared that the COVID-19 virus had hit the world and entered Indonesia and schools were closed. Google Classroom is used by teachers to deliver learning materials, discussions online, if there is an assignment the teacher asks students to send it via Google Classroom because it is easy for teachers to store assignments and assessments and students also feel more effective with the learning carried out by the teacher.

In Google Classroom there are also Flipbook and Quizizz teaching materials. If learning is in class, the teacher directs students to access Google Classroom using students' cellphones because the teaching material is already stored there in Flipbook. When the teacher explains the material, students who don't understand it can access the material again in Google Classroom, which is usually also used to collect assignments and assess students. Quizizz is an effective place for teachers to take assessments or add value to students. The questions created on Quizizz are easy to understand and when students have completed them, it will be shown how many assessment scores they got. After the author draws conclusions regarding the suggestions given by the author regarding the application of Technological Pedagogical Content Knowledge (TPACK) learning, namely with the increasingly advanced development of educational technology, educators and schools must be able to adapt well to learning. However, with the advancement of the role of learning technology in schools, it is only a tool to help the process of delivering learning, therefore the role of education is needed as an active role as a facilitator so that students continue to play an active role in learning, therefore, even though learning is carried out using increasingly advanced technology, it The active role of educators must continue to be carried out. Future researchers should conduct further research on the use of information technology as a learning resource because information technology will continue to develop.

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