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Lesson Plan Profile on Respiratory System Material with the TPACK Approach During the Pandemic Period at Senior High School Brebes Regency

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ABSTRACT

TPACK (Technological Pedagocical Content Knowledge) is about the importance of integration between technology and pedagogy in content development in education. This study aims to determine the lesson plan Profile for Respiratory System Material with the TPACK Approach in State Senior High Schools Brebes Regency during the Pandemic Period. The subject in this study was the lesson plan for the respiratory system material for class XI in the even semester. The sampling technique used in this research is proportional stratified random sampling. This study uses instruments in the form of observation sheets and interview questionnaires. The results of this study indicate that lesson plan approaching TPACK compiled there are 3 components that are in the very good category, namely Content Knowledge (CK) with a percentage of 91.25%, Pedagogical Knowledge (PK) with a percentage of 90.83% and Pedagogical Content Knowledge (PCK) with a percentage of 81.25%. Components that are included in the good category have 1 component, namely Technological Knowledge (TK) with a percentage of 60.42%. Then there are 3 components that are in the sufficient category, namely the Technological Content Knowledge (TCK) component with a percentage of 51.67%, Technological Pedagogical Knowledge (TPK) with a percentage of 52.92% and component (TPACK) with a percentage of 48.33%. The lesson plan profile was included in the "good" category with an average percentage of 68.10%. It's means that during pandemic period, the Biologi lesson plan for respiratory system material in senior high school Brebes Regency was made by TPACK approach.

Introduction

Information and Communication Technology (ICT) is currently developing very rapidly, along with the times that it is used as data processing which includes processing, obtaining, compiling, storing, and manipulating in various ways and procedures to produce quality and

high-value information (Harahap, 2020). The trend of increasing internet use has made many schools and universities take advantage of it the internet as a tool in learning. Many lessons are designed with using online modes. The government through the ministry of education provides System grants Online Learning (SPADA) which aims to equalize access to learning by open online lectures (online) that can be accessed widely by the public. Through utilization Internet technology is expected to add learning resources for students (Amam & Lismayanti, 2020) For teachers to be successful in their career, they need to develop themselves in pedagogy, technology, and their content areas. By using information and communication technologies, teachers can follow developments in their areas, transfer the contemporary approaches and applications regarding teaching methods into their instruction, and keep themselves up-to-date. For these reasons, technology plays a critical role for teacher knowledge improvement (Sahin, 2011).

The ability of a teacher to develop learning tools in the form of lesson plans is very important, because it can improve the quality of teacher competence. Lesson Plan is a guideline that contains the steps that will be carried out by the teacher in their learning to achieve a basic competency set out in the content standards and described in the syllabus (Mawardi, 2019). Lesson Plan is described from the syllabus to direct student learning activities in an effort to achieve basic competencies. Teachers who carry out learning activities are required to prepare it's completely and systematically so that learning takes place interactively, inspiring, fun, challenging, motivating students to participate actively, creativity, independence according to talents, interests and physical and psychological development of students. Lesson plan is a guideline that contains the steps that will be carried out by the teacher in their learning to achieve a basic competency set out in the content standards and described in the syllabus. According to Permendikbud Number 22 of 2016, the Lesson Plan consists of 13 components, namely school identity, namely the name of the education unit, the identity of the subject or theme/subtheme, class/semester, subject matter, time allocation, learning objectives, basic competencies and indicators of competency achievement, learning materials, learning methods, learning media, learning resources, learning steps, assessment of learning outcomes (Rusman, 2016).

Lesson plan for biology subject for eleventh semester even in based competence (KD). There are is KD 3.8 Analyzing the relationship between the structure of tissues making up organs in the respiratory system in relation to bioprocesses and functional disorders that can occur in the human respiratory system and KD 4.8 Presenting the results of the analysis of the effect of air pollution on abnormalities in the structure and function of organs human respiration based on literature study. Broadly speaking, the material of the respiratory system can be defined as a process of taking in oxygen and releasing carbohydrates and using energy in the body. The most responsible organ in the respiratory system is the lungs, which are the carriers of gas exchange during the breathing process. During the process of breathing, it was not only the nose and lungs that worked. There are other respiratory organs such as the mouth, pharynx, larynx, trachea, diaphragm, bronchi, bronchioles, alveoli, and capillaries. The respiratory system material is one of the biological materials that are considered difficult for students, this is because in studying it students cannot see directly the organs that make up the respiratory system contained in the body cavity and the processes that occur in the body (Panjaitan et al., 2020).

A pandemic is an event that spreads a virus and this virus is called Corona Virus Disease (Covid-19), Indonesia is also one of the countries affected by this virus. This virus was first

detected in Wuhan City, Hubei, China on December 31, 2019 and was declared a pandemic by the World Health Organization (WHO) on March 11, 2020. The Covid-19 pandemic has occurred until now. The Covid-19 pandemic that occurred in Indonesia made all activities in various fields carried out by social distancing. In addition, the central government also appealed to local governments in the circular letter of the Ministry of Education and Culture number: 36962/MPK.A/HK/2020 regarding online learning and working from home in order to prevent the spread of the Covid-19 virus.

During a pandemic period, online learning can be used as a distance learning solution when unexpected things occur, such as natural disasters in an area or virus outbreaks like what is happening today. There are several alternatives so that learning continues amid the limitations between teachers and students by utilizing various media for online learning, namely using social media such as WhatsApp, Telegram, Zoom Meeting, Google Meet or other media as learning media (Atsani, 2020) (Syarifudin, 2020)

Facts on the ground, education in Indonesia seems to still not be able to keep up with the rapid development of technology. Teachers in Indonesia are still not aware of the importance of using technology in education and the implementation of the 2013 curriculum, teachers are required to master content, pedagogy and are also expected to apply technology in learning. Schools and teachers in Indonesia still have problems, including the lack of teacher ability in compiling learning tools, mastery of material, and mastery of media as well as the application of technology into learning. The ability of teachers to design lesson plans in the form of lesson plans was still in the low category with an average of 42.86% (Suyamto et al., 2020) (Arifin, 2020)

The teachers in Brebes have not been able to use LCD (Liquid Crystal Display) facilities to support classroom learning. This is because teachers are less motivated in following the latest technology and also in improving their professional abilities, they still only teach with the lecture method and student worksheets only. It is evidenced by the data on the UN scores obtained from the Education Assessment Center of the Ministry of Education and Culture in 2019 Public High Schools in Brebes Regency in biology subjects have an average of 51.70 where the results of the average exam scores in science subjects are still relatively low (Masruroh et al., 2012)

It is evidenced by the data on the exam scores obtained from the Education Assessment Center of the Ministry of Education and Culture in 2019 Public High Schools in Brebes Regency in biology subjects have an average of 51.70 where the results of the average exam scores in science subjects are still relatively low.

In pandemic conditions, teachers need to use the right learning approach and in accordance with the material to be delivered and the learning objectives to be achieved. One of them is by using a TPACK-based learning approach or Technological, Pedagogical, And Content, Knowledge. The quality of learning, a good framework is needed to develop technology, pedagogics, and interesting learning content (Rosenberg & Koehler, 2015). The teachers need to use the right learning approach and in accordance with the material to be delivered and the learning objectives to be achieved. TPACK is knowledge about the importance of integration between technology and pedagogy in the development of content in education (Oyanagi & Stake, 2016).

Seeing the importance of TPACK as a manifestation of teacher competence contained in the lesson plan to face the challenges of technological development in learning activities during a pandemic, the researchers conducted research with the aim of photographing the

profile of the lesson plan on Respiratory System material with the TPACK approach during a pandemic in senior high schools in Brebes Regency.

Research Methods

The research design used in this study is proportional stratified random sampling because the population in this study has elements that are not homogeneous and proportionally stratified. In this study, based on the ranking of the results of the National High School National Examination in Brebes Regency. Proportionate Stratified Random Sampling is sampling from population members randomly and proportionally stratified and the formula used to calculate the sample uses a formula developed by Isaac and Michael with an error rate of 1%, 5%, and 10% (Sugiyono, 2010).

Analysis and interpretation of the data from this study is Qualitative Data Analysis. Qualitative data analysis is a qualitative analysis process that is based on the existence of a semantic relationship between the variables being studied. The purpose of qualitative data analysis is for researchers to get the meaning of the relationship between the variables so that they can be used to answer the problems formulated in the study, converted into narrative form or interpreted into a form that is easier to understand (Sapartien, 2017). According to (Sugiyono, 2010) data analysis is a process of finding and compiling data obtained by organizing data, describing and synthesizing, selecting important data and those that will be studied to give meaning, arranging into patterns or categories and looking for relationships between concepts, and choosing and draw conclusions.

Findings

Based on the results of filling out the observation sheet for the TPACK component in the lesson plan for Respiratory System Materials during the Pandemic Period at State Senior High Schools Brebes Regency, It is obtained in Table 1 below.

Table 1 The Lesson Plan for Respiratory System Materials During The Pandemic Period at The Public High Schools Brebes Regency

LESSON PLAN	ANALYSIS RESULT (%)	CATEGORY
R.A	63,63	GOOD
R.B	63,63	GOOD
R.C	64,2	GOOD
R.D	64,8	GOOD
R.E	67,8	GOOD
R.F	67,8	GOOD
R.G	71,4	GOOD
R.H	71,4	GOOD
R.I	75	GOOD
R.J	75,7	GOOD
AVERAGE	**68,52**	**GOOD**

The lesson plan profile for the respiratory system material with the tpack approach in state senior high schools in brebes regency during the pandemic period in terms of filling out the observation sheet has a different percentage of the TPACK approach. It can be seen in table

1 that based on the results of the analysis of the lesson plan profile observation sheet for the respiratory system material with the TPACK approach, the highest percentage is 75.57% in the "good" category and the lowest percentage is 63.63% in the "good" category. The average percentage of the lesson plan profile for the respiratory system with the TPACK approach is 68.52% in the "good" category.

The implementation of the TPACK component in the lesson plan for respiratory system materials during the pandemic period in state senior high schools Brebes Regency is obtained in Table 2 below.

Table 2 The TPACK component in The Lesson Plan For Respiratory System Materials During The Pandemic Period in State Senior High Schools Brebes Regency

TPACK COMPONENTS	PERCENTAGE (%)	CATEGORY
CK	91,25	VERY GOOD
PK	90,83	VERY GOOD
TK	60,42	GOOD
TCK	51,67	ENOUGH
TPK	52,92	ENOUGH
PCK	81,25	VERY GOOD
TPACK	48,33	ENOUGH
AVERAGE	**68,52**	**GOOD**

Based on table 2 the average value obtained as a whole which includes the seven components of TPACK in lesson plans is in the "good" category with a percentage of 68.10%. There are 3 components that are in the "very good" category, namely CK with a percentage of 91.25%, PK with a percentage of 90.83% and PCK with a percentage of 81.25%. Components that are included in the "good" category have 1 component, namely TK with a percentage of 60.42%. Then there are 3 components that are in the "enough" category, namely the TCK component with a percentage of 51.67%, TPK with a percentage of 52.92% and the TPACK component with a percentage of 48.33%.

Based on the results of data analysis, it is known that the Content Knowledge component in the lesson plan device for respiratory system materials at public high school is included in the "very good" category with a percentage of 91.25%. The CK component in each school is included in the very good category, this is because the teacher provides more up-to-date material development, task selection, explanations, interpretation of student responses, emphasis on student understanding, analysis of errors and difficulties that students may experience while learning during a pandemic. The CK knowledge is important in improving the teaching and learning process which aims to provide a complete understanding to students (Purwoko, 2017).

Based on the results of data analysis, it is known that the Pedagogical Knowledge (PK) component in the lesson plan device for respiratory system materials in public High Schools is included in the very good category with a percentage of 90.83%. This is because the teacher's knowledge of theories in designing learning is very good, the development of lesson plans is also appropriate. The teacher has conducted an assessment of student learning outcomes, the teacher has been able to adjust the teaching based on what students understand and do not understand and the teacher already knows the appropriate learning approach to apply. The PK studied were student assessments, teaching approaches, classroom management, adjustment of learning styles with students with high categories (Hidayati et al., 2019).

In other hand, based on the results of the analysis, it can be seen that the Technological Knowledge (TK) component in the lesson plan device for respiratory system materials at SMA Negeri Brebes is included in the good category with a percentage of 60.42%. This is because teachers have integrated technology in learning, teachers have used technology for communication processes, student data processing, and supporting teacher productivity. Moreover, during the Covid-19 pandemic, technology has become an important factor that must be mastered by all groups, both teachers and students and teachers have adapted to technology in learning through the use of applications such as zoom meetings, google meet, google classroom, quizzes and so on. Learning using technology will provide higher motivation to students, because technology is associated with fun, creativity, and games so that learning is more effective and efficient (Manongga, 2021).

Meanwhile, the Technological Content Knowledge (TCK) component of the lesson plan device for respiratory system materials at public high school Brebes Regency data analysis result is in the sufficient category with a percentage of 51.67%. This is because teachers already know various kinds of technology that can be integrated in online biology learning such as video conferencing for practical activities and also using animated videos contained in the youtube application as teaching material, but some teachers still do not understand the features in each application. The lesson plans studied were categorized as poor because they were not accustomed to using high-level technology applications to be applied in the learning process (Innaha & Setyaningsih, 2018)

Based on the results of data analysis, it is known that the Technological Pedagogical Knowledge (TPK) component in the lesson plan device for respiratory system materials at public High School in Brebes regency is included in the "enough" category with a percentage of 52.92%. This is because the teacher has integrated technology in the learning process, namely by video teleconference using Zoom Meeting to deliver learning. Then students are given motivation and guidance to see, observe, read and write. The teacher gives questions to students about the material of the respiratory system. Students are asked to discuss, gather information and present. Through Zoom Meetings, students present the results of their discussions, then a written exam evaluation is carried out. The use of computers is able to facilitate and accelerate student work and creates a sense of pleasure because students interact with colors, images, sounds, videos and pleasant situations and conditions which are very important factors to achieve learning effectiveness.

Based on the results of data analysis, it is known that the Pedagogical Content Knowledge (PCK) component in the lesson plan learning device for respiratory system materials in public high School Brebes Regency included in the very good category with a percentage of 81.25%. This is because the teacher is able to teach respiratory system material using self-made learning video media and some are sourced from relevant youtube channels. Then the teacher as a facilitator in the implementation process of learning to watch with students and provide reflections on the learning material so that students better understand the material presented. Use of Youtube videos in the learning process can improve students' understanding of concepts and practical skills. Through the use of Youtube video media, it can also increase the level of student activity in the learning process. learning is more varied and also not easily bored at the time of delivery of information (Trianto et al., 2019).

Meantime, based on the results of data analysis, it is known that the Technological Pedagogical And Content Knowledge (TPACK) component of the lesson plan learning device for respiratory system materials at Public High School Brebes Regency is included in the sufficient category with a percentage of 48.33%. This is because the teacher has integrated

content knowledge and technology during the online learning process which is indicated by changes in the learning process, the use of media and learning models. However, there are still obstacles faced by teachers, including inadequate facilities and infrastructure such as internet quotas, cellphones/laptops and also signals, then lack of motivation to learn and student literacy during the learning process. The TPACK has been running smoothly, but some obstacles are still found, including time constraints, the use of technology, facilities and infrastructure constraints and the ability to make lesson plan which is relatively low (Ulum & Arifin, 2022).

Discussion

TPACK is a framework that tries to understand the relationship between knowledge about teaching PK and the use of technology (TK). By TPACK, teacher knowledge to integrate technology in learning makes learning effective and efficient. Technology integration is considered as a closely related component of teaching and is included in PCK (Oyanagi & Stake, 2016). There are seven components of TPACK, namely CK, TCK, PK, TPK, TK, PCK, and TPACK (Innaha & Setyaningsih, 2018).

The lesson plan profile for the respiratory system material with the TPACK approach in State Senior High Schools in Brebes Regency During the Pandemic in terms of filling out the observation sheet by the teacher has a different percentage of the TPACK approach. It can be seen in table that based on the results of the analysis of the lesson plan profile observation sheet, the respiratory system material with the TPACK approach has an average percentage of 68.52% with a “good” category. The highest percentage is 75.57% in R.J and R.I with a percentage of 75%, R.G and R.H with a percentage of 71.4%, R.E and R.F with a percentage of 67.8%, R.D with a percentage of 64.2% and R.C with a percentage of 64, 2%. And the lowest percentage is 63.63% in R.A and R.B. This percentage difference is influenced by the achievement of the TPACK component in each lesson plan learning device.

Conclusion

Based on the results of the study, it can be concluded that the lesson plan profile of the respiratory system material with the TPACK Approach in State Senior High Schools throughout Brebes Regency During the Pandemic Period is included in the good category with an average percentage of 68.10%. As for the average value obtained, there are 3 components that are in the "very good" category, namely CK with a percentage of 91.25%, PK with a percentage of 90.83% and PCK with a percentage of 81.25%. Components that are included in the "good" category have 1 component, namely TK with a percentage of 60.42%. Then there are 3 components that are in the "enough" category, namely the TCK component with a percentage of 51.67%, TPK with a percentage of 52.92% and the TPACK component with a percentage of 48.33%. So it is necessary to do further to develop research on TPACK.

References

Amam, A., & Lismayanti, L. (2020). Perangkat Project-Based Learning berbantuan ICT: Optimalisasi Kemampuan Pemecahan Masalah dan Kecemasan Matematis Siswa. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *4*(2), 351. https://doi.org/10.33603/jnpm.v4i2.4160

Arifin, Z. (2020). *Peningkatan kemampuan guru dalam membuat rencana pelaksanaan pembelajaran (Rpp) Tematik 1 Halaman Melalui Workshop Daring dengan Variasi Model Jigsaw di Unit Pelaksana Teknis Daerah (UPTD) Sekolah Dasar (SD) negeri genteng 2 bangkalan*. *3*(2), 201–215. https://doi.org/10.19105/re-jiem.v3i2.4722

Atsani, Z. (2020). Transformasi Media Pembelajaran Pada Masa Pandemi Covid-19. *Jurnal Teknologi Pendidikan*, *22*(1), 65–70.

Harahap, L. (2020). *Peran Teknologi Informasi Dan Komunikasi Dalam*. 375–381.

Hidayati, N., Setyosari, P., & Soepriyanto, Y. (2019). *Kompetensi Technological Pedagogical Content Knowledge (Tpack) Guru Soshum Setingkat SMA Nurul Hidayati, Punaji Setyosari, Yerry Soepriyanto*. 291–298.

Innaha, R., & Setyaningsih, E. (2018). Kemampuan technological content knowledge (TPK) guru IPA di sekolah inklusi SMP Negeri 23 Surakarta tahun ajaran 2017-2018. *Seminar Nasional Pendidikan Biologi Dan Saintek III*, 496–503.

Manongga, A. (2021). Pentingnya teknologi informasi dalam mendukung proses belajar mengajar di sekolah dasar. *Pascasarjana Univearsitas Negeri Gorontalo Prosiding Seminar Nasional Pendidikan Dasar*, *978-623–98*(November), 1–7.

Masruroh, U., THomas, P., & Latifah, L. (2012). Pengaruh Kompensasi Dan Disiplin Kerja Terhadap Kinerja Guru Ekonomi SMA Negeri Brebes. *Economic Education Analysis Journal*, *1*(2).

Mawardi, M. (2019). Optimalisasi Kompetensi Guru Dalam Penyusunan Rencana Pelaksanaan Pembelajaran. *JURNAL ILMIAH DIDAKTIKA: Media Ilmiah Pendidikan Dan Pengajaran*, *20*(1), 69. https://doi.org/10.22373/jid.v20i1.3859

Oyanagi, W., & Stake. (2016). *Capacity Building in Technological Pedagogical Content Knowledge for Preservice Teacher*. *10*(1), 33–44.

Panjaitan, R. G. P., Titin, T., & Putri, N. N. (2020). Multimedia Interaktif Berbasis Game Edukasi sebagai Media Pembelajaran Materi Sistem Pernapasan di Kelas XI SMA. *Jurnal Pendidikan Sains Indonesia*, *8*(1), 141–151. https://doi.org/10.24815/jpsi.v8i1.16062

Purwoko, R. Y. (2017). Analisis kemampuan content knowledge mahasiswa calon guru matematika pada praktek pembeljaran mikro. *Jurnal Pendidikan Surya Edukasi (JPSE)*, *3*(1), 55–65.

Rosenberg, J. M., & Koehler, M. J. (2015). Context and technological pedagogical content knowledge (TPACK): A systematic review. *Journal of Research on Technology in Education*, *47*(3), 186–210. https://doi.org/10.1080/15391523.2015.1052663

Rusman. (2016). *Model-model pembelajaran - mengembangkan profesionalisme guru*.

Sahin, I. (2011). Development Of Survey Of Technological Pedagogical And Content Knowledge (TPACK). In *TOJET: The Turkish Online Journal of Educational Technology* (Vol. 10, Issue 1).

Sapartien, R. (2017). Peningkatan Hasil Belajar Matematika Melalui Media Tabel Dengan Power Point Pada Siswa Sekolah Dasar. *Refleksi Edukatika : Jurnal Ilmiah Kependidikan*, *7*(1), 26–30. https://doi.org/10.24176/re.v7i1.1808

Sugiyono. (2010). *pdf-buku-metode-penelitian-sugiyono_compress.pdf*.

Suyamto, J., Masykuri, M., & Sarwanto, S. (2020). Analisis Kemampuan Tpack (Technolgical, Pedagogical, and Content, Knowledge) Guru Biologi Sma Dalam Menyusun Perangkat Pembelajaran Materi Sistem Peredaran Darah. *INKUIRI: Jurnal Pendidikan IPA*, *9*(1), 46. https://doi.org/10.20961/inkuiri.v9i1.41381

Syarifudin, A. S. (2020). Impelementasi Pembelajaran Daring Untuk Meningkatkan Mutu Pendidikan Sebagai Dampak Diterapkannya Social Distancing. *Jurnal Pendidikan Bahasa Dan Sastra Indonesia Metalingua*, *5*(1), 31–34. https://doi.org/10.21107/metalingua.v5i1.7072

Trianto, T. T., Hartono, & Akhlis, I. (2019). Pemanfaatan Youtube untuk Pembelajaran Fisika dalam Meningkatkan Pemahaman Konsep dan Keterampilan Laboratorium Siswa. *Seminar Nasional Pascasarjana UNNES*, *2012*, 744–751.

Ulum, B., & Arifin, B. (2022). Pendampingan Penyusunan Rpp Berbasis Tpack. *Jurnal Pengabdian Masyarakat*, *5*(1), 162–168.