

Effective Whiteboard as Learning Media for Hybrid Learning System in High School

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Abstract - At the beginning of 2020, COVID-19 was a virus that spread and occurred simultaneously in various countries around the world, including Indonesia. This pandemic has an impact on sectors in Indonesia, one of which is the impact on education. With this pandemic, the government has implemented online learning until finally the government has implemented hybrid learning. This study's purpose is to determine whether this hybrid learning is effective in grade 12 students. Data collection was carried out in distributing questionnaires, interviewing grade 12 students and making direct observations to several schools. The results of our analysis show that hybrid learning for grade 12 students is considered less effective because students experience several changes in learning outcomes, understanding of the material and lack of communication between teachers and friends. However, because this research is still early, we will use the results of this study as the basis for further research where we will discuss the tools or products that are assembled regarding user needs in solving problems that occur in hybrid learning.

Keywords: Education, Hybrid, Pandemic, Student.

INTRODUCTION

At the beginning of 2020, the world health organization (WHO) declared COVID-19 as a global pandemic, meaning that this virus has become a disease that spreads and coincides in various countries worldwide, including Indonesia. Based on statistical data from the Task Force for Handling COVID-19 (Michelle L. Holshue et al., 2020) (Mecenas et al., 2020), the virus that has been endemic in Indonesia since the beginning of 2020 has had 4.62 million total cases and 144,000 deaths in Indonesia as of November 28, 2021. In addition, COVID-19 (Razon, 2020) (Wu et al., 2020) has impacted various sectors such as health, tourism, economy, and education. In the education sector, COVID-19 has changed the learning process at different levels of education, from PAUD to tertiary institutions. It requires the adaptation of learning methods so that teaching and learning activities can continue to take place.

The Ministry of Education and Culture issued a series of policies to respond to the development of the spread of Covid-19, in accordance with Circular Letter 4 of 2020 concerning the Implementation of Education policies in the Emergency Period for the Spread of Coronavirus Disease. This makes schools at various levels of education, including high school, ask their students to study at home and implement distance learning. PJJ Online specifically combines electronic

technology and internet-based technology. This PJJ system does make students not come to school and stay at home (kemendikbud.go.id). According to a survey conducted by UNICEF related to the experience of students studying from home during the Covid-19 pandemic on 18-29 May 2021 and 5-8 June 2020, it was stated that as many as 66 percent of 60 million students from various levels of education in 34 provinces claimed to be uncomfortable studying. At home during the Covid-19 pandemic. The survey also found that while studying at home, 38 percent of the students who were respondents said the lack of guidance from the teacher was the main obstacle.

Complaints from students about distance learning, which is not comfortable to study at home, and the lack of guidance from teachers which is the main obstacle. In the end, the Ministry of Education and Culture plans to reopen schools for face-to-face lessons for students across Indonesia in January 2021, with an even stricter process, namely 5M (Wearing masks, Keeping Distance, Washing Hands, Avoiding Crowds, and Reducing Mobility). The Ministry of Education and Culture has planned to return to face-to-face schools in January 2021. Still, the surge in COVID-19 began to increase again, especially after Eid, the number of Covid cases increased to 112.22 percent. The government also provides a policy of implementing PPKM Level 4 so that there are not many people who do outside activities. One solution to eliminate student complaints in distance learning is if the government implements face-to-face learning based on Hybrid Learning. However, Hybrid Learning began to be held gradually when PPKM in Indonesia started to decline from PPKM level 4 to level 1. Hybrid Learning is a learning method that combines online learning and face-to-face learning. Lynn et al (2014)(Bains, 2010) defines Hybrid Learning, or Blended Learning, as combining e-learning-based learning methods (electronic learning) with face-to-face or conventional learning methods(Rohaeni et al., 2021). Based on the Joint Decree of the Minister of Education and Culture, Minister of Religion, Minister of Health, and Minister of Home Affairs Number 03/KB/2021, Number 384 of 2021, Number HK.01.08/MENKES/4242/2021, Number 440-717 of 2021 concerning Guidelines for Implementation of Learning During the Covid-19 Pandemic Period(Hunter et al., 2021)(Shen et al., 2020), for academic units that carry out limited face-to-face learning, it can be carried out with a maximum capacity of 50 percent. However, this kind of capacity sharing makes teachers work extra because they have to teach in two directions; the teacher must lead in the classroom offline. After that, the teacher has to teach(Permana et al., 2019)(Megayanti et al., 2019) online to provide the same material to students who get online learning.

The author conducted surveys and observations in 3 high and vocational schools that applied the hybrid learning method in limited face-to-face learning. One of the high schools that uses the hybrid learning method is SMAN 1 Tambun Selatan in Bekasi Regency. SMAN 1 Tambun Selatan is one of the public high schools in Bekasi Regency, West Java, that uses the 2013 curriculum and annually produces the best graduates in Bekasi Regency. Reporting from kompas.com, based on data for the 2021 LTMPT UTBK scores, SMAN 1 Tambun Selatan is ranked 5 out of 10 high schools in Bekasi, West Java, and is one of the best 1,000 schools in Indonesia. Since early September 2021, SMAN 1 Tambun Selatan has implemented limited face-to-face learning using a hybrid method with 2-way knowledge by teachers to students at home and school. Students take turns carrying out teaching and learning activities in schools based on the serial number of absences because the maximum number of people per class is 18 people out of a total of approx. The learning media used in hybrid learning at SMAN 1 Tambun Selatan include blackboards, laptops, and projectors. Extracurricular activities, organizations, flag ceremonies, and practical lessons such as physical education or science practice are limited and eliminated. Based on the results of questionnaires distributed online to students of SMAN 1 Tambun Selatan, almost all student activities from grade 10 to grade 12 were carried out in the classroom due to an appeal from the school not to leave the classroom during teaching and learning activities unless there was a particular interest. The activities that are most often carried out are studying, eating, and drinking. Other activities carried out in the classroom during hybrid learning are doing assignments, worship, and organizational meetings. Based on the results of interviews conducted with teachers and grade 12 students at SMAN 1 Tambun Selatan, the implementation of hybrid learning is considered to have several shortcomings. According to one mathematics teacher at SMAN 1 Tambun Selatan, there are difficulties when teaching, such as the problem of the projector being used, and this hybrid learning requires the installation of a tool to convey material to students at home. Hence, it takes time before learning begins. Grade 12 students of SMAN 1 Tambun Selatan considered hybrid learning less effective because of limited study time and teachers more focused on students at school, so students at home could not fully understand the material presented by the teacher.

Since this pandemic occurred and schools were held boldly, teacher-student meetings to carry out classroom learning and practice had to change. The goal is that the target of achieving student

learning outcomes produces good results, even though this learning is carried out boldly. Due to the phenomenon of this change in learning methods, there are several issues that the author catches that have occurred during hybrid learning in high school.

Academic Performance Issue

The academic performance issue is very important for high school 12th graders who are about to take the school and college entrance examinations. By changing the face-to-face learning method to hybrid learning method, it can directly and indirectly be related to the final results for students because the time of subjects is becoming more limited, and the time for discussion in class is also limited.

Understanding of Learning Materials Issue

There has been a change in the learning system from face-to-face (offline) to online, and then it has changed to using the Hybrid Learning system. This change took place in a short time, so schools, in this case, teachers and students, had to adapt quickly to keep up with these changes. Especially for grade 12 students who need more understanding of the material, with this Hybrid Learning system, students learn online and face-to-face, so understanding the material becomes more difficult and limited.

Psychological of Grade 12 Students Issue

Grade 12 is the last grade at the High School level before graduating and continuing to the next level. However, before graduating, they have to take the National Examination besides that there are also other exams if they want to continue to a higher level, such as higher education, so the physical and mental burden experienced by grade 12 students is quite heavy, especially with the Hybrid Learning system which Making students not always in class not only makes it more difficult for students to understand the material but can also reduce enthusiasm and motivation to learn.

Research Framework

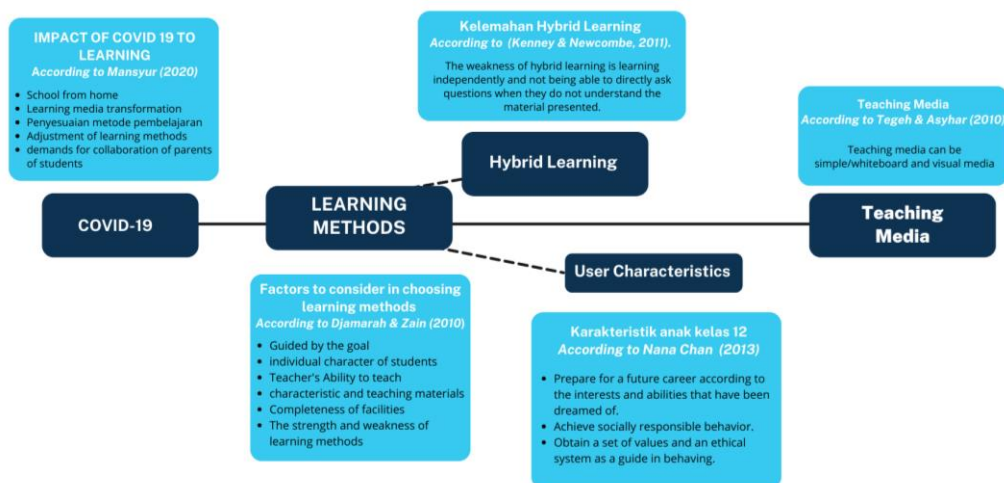


Figure 1: Research Framework, Mind Map
Source: Authors

Research Method

Data Analysis Method

The research method used in this study is qualitative. According to Creswell (2009), qualitative research methods involve asking questions and procedures, collecting specific data from participants, collecting particular data from participants, analyzing data inductively, starting from specific themes to themes. -general themes, and interpret the meaning of the data. Qualitative research method data in the form of text, images, content analysis, interviews, and direct observation.

Design Approach Method

Authors use the Design Thinking Method to provide solutions to the problems we take. Design Thinking is a mindset that can be a universal method of solving innovation or problem-solving approaches. According to George Kembel (2009), design thinking is a creative approach to collecting information and opportunities to be synthesized into innovations and work ideas. This design thinking method consists of 5 stages :

Emphasize. At this stage, authors conducted observations, interviews, and distributed questionnaires to residents of high school who were taking part in hybrid system learning, especially to grade 12 students. Direct observations were carried out at SMAN 1 Tambun Selatan to know the conditions directly from the place we studied. There are two problems at the SMAN 1 Tambun Selatan: crowds during breaktime and ineffective hybrid learning.



Figure 2: Hybrid Learning at SMAN 1 Tambun Selatan, 2021, Photo Documentation.
Source: Authors

Define. After found the problem at SMAN 1 Tambun Selatan, the authors made a questionnaire and distributed it to the 12th grade students. The results of the questionnaire showed that ineffective hybrid learning is a problem that must be solved immediately with percentages 67,7%.

Of the problems below, which one do you think is more important to find a solution?

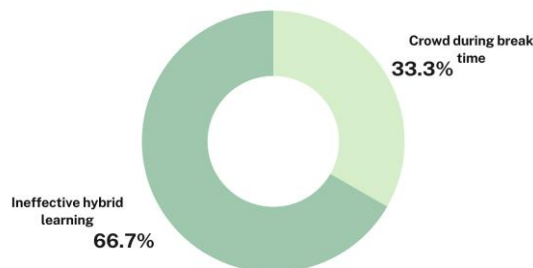


Figure 3: Problem during hybrid learning, Chart.
Source: Authors

Ideate. Looking for solution ideas that can be used to overcome various problems that have been defined in the define stage. **Prototype.** Products developed from ideas with reduced versions, or can also be said as simulation or sample versions. **Test (Test to be performed on users).** The stages in Design Thinking have several different stages, but the point is how to collect as much data as possible directly from the source, then the process of exploring ideas and developing into prototypes and after that doing tests.

Method of collecting data

Data were obtained from direct observation by conducting surveys and distributing questionnaires and interviews. This questionnaire is a list of questions or written statements that must be answered or filled out by the respondent following the instructions. This questionnaire was distributed to pre-selected schools. Interviews were conducted in two ways, namely by asking directly to the respondents and indirectly by using media such as chat media. Then, the results of these observations are strengthened by collecting literature studies, such as journals, articles or news, books, and other writings.

According to the book *Research Methodology* by Ranjit Kumar (2010), the word research consists of two syllables, back and Search Dictionary defines the first as a prefix meaning again, new, or again and the last as a verb which means to examine carefully and carefully, to test and try, or to investigate. Together they form a noun describing a careful, systematic, patient study and investigation in some area of knowledge, which is carried out to establish a fact or principle. (Grinnell 1993:4) Grinnell further adds: 'research is a structured inquiry that uses accepted scientific methodologies to solve problems and create new knowledge that is generally applicable.' (1993:4).

Burns (1997: 2) defines research as a systematic inquiry to find answers to a problem. According to Kerlinger (1986: 10), 'scientific research is a systematic, empirically controlled and critical investigation of propositions about alleged relationships about various phenomena'. Bulmer (1977: 5) states: 'Nevertheless, sociological research, as research, is primarily aimed at constructing systematic, reliable and valid knowledge about the social world.'

Research process: characteristics and requirements From the definition, it is clear that research is a process of collecting, analyzing, and interpreting information to answer questions. However, to qualify as research, the process must have specific characteristics: it must be, as far as possible, controlled, rigorous, systematic, valid and verifiable, empirical, and critical.

Controlled

In real life, many factors affect an outcome. Certain events are rarely the result of a one-to-one relationship. Some relationships are more complex than others. Most outcomes are sequelae of the interplay of multiple interacting relationships and factors. In studying cause-and-effect relationships, it is essential to relate effects to causation and vice versa. In the study of causation, establishing this connection is very important; however, in practice, especially in the social sciences, it is difficult - and often impossible - to make connections.

Tough

Care must be taken to ensure that the procedures followed to find answers to questions are relevant, appropriate, and justifiable. Again, rigor varies widely between the physical and social sciences and within the social sciences.

Systematic

This implies that the procedures adopted to conduct the investigation follow a particular logical sequence. Different steps cannot be done haphazardly. Some procedures must follow other procedures.

Valid and verifiable

This concept implies that whatever the authors conclude based on author findings is valid and can be verified by the authors and others.

Results and Discussion

The Covid-19 pandemic has succeeded in accelerating the process of moving the education system which previously used a face-to-face learning system to the occurrence of a hybrid learning system where online and offline learning take place simultaneously in the classroom. One of them is in high school, where students and teachers must quickly adapt to the rapidly changing education system.

Academic Performance

EMPHATY MAP	
<p>Feel</p> <p>can't time management</p> <p>Complicated There are limitations</p> <p>Not focus</p> <p>Ineffective</p>	<p>Says</p> <p>More and more tasks</p> <p>Shorter Study Hours</p> <p>Little task collection time</p> <p>Material presented a little</p>
<p>Think</p> <p>There is a change in learning method</p> <p>The teacher's focus is divided when teaching</p> <p>The teacher ignores the students who are at home</p>	<p>Does</p> <p>Discuss in the classroom</p> <p>Bring lunch from home</p> <p>Take turns in school</p> <p>Learn to be independent</p>

Figure 4: Empathy Map of Ferina Octora, SMAN 1 Tambun Selatan 12th Grade Student
Source: Authors

EMPHATY MAP	
<p>Feel</p> <p>There are limitations</p> <p>Complicated</p> <p>Ineffective</p> <p>Not focus</p>	<p>Says</p> <p>The material provided is incomplete</p> <p>Lack of interaction with students</p> <p>Want normal face-to-face learning</p>
<p>Think</p> <p>There is a change in learning method</p> <p>The teacher's focus is divided when teaching</p>	<p>Does</p> <p>Going home from school earlier than usual</p> <p>Difficulty moving the camera on the whiteboard</p> <p>The teacher has to teach 2 times</p>

Figure 5: Empathy Map of Mrs. Ari Isnaeni, SMAN 1 Tambun Selatan 12th Grade Teacher
Source: Authors.

From the results of interviews and questionnaires can be seen that changing the operating hours of learning in the classroom, making the material delivered by the teacher less and quite limited, also will make the performance of the results in the form of scores that are not satisfactory for each student. Ferina Octara as a student at SMAN 1 Tambun Selatan said that with the reduced study time, the material presented was limited, but the tasks given by the teacher were quite a lot. Likewise, the teacher at SMAN 1 Tambun Selatan, Mrs. Ari Isnaeni, said that the material presented to her students was limited due to the reduced learning time.

Students and teachers lack discussion in class because there are students who get online learning. The use of learning media through video conferencing and instant messengers, as well as hybrid learning methods where students study at home and study in face-to-face classes, provide additional work for teachers because they have to focus on both.

In addition, we also distributed questionnaires to high school students. In the chart below, high school students choose changes in learning methods and also changes in learning time regarding what changes occur when this hybrid learning takes place. A learning method in which high school students have to do hybrid learning such as conducting sessions in each class, some were doing face-to-face and online learning at home. Changes in learning time make students feel less able to learn from the teacher.

What changes did you feel when implementing hybrid learning?

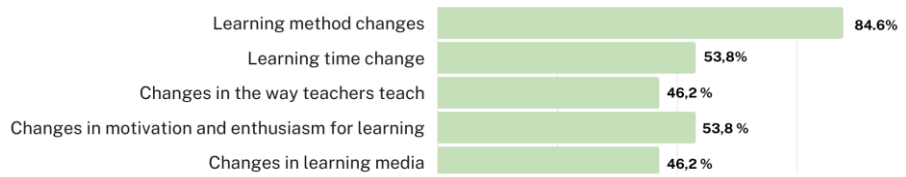


Figure 6: Changes in Hybrid Learning System, 2021, Chart.
Source: Authors

The media used in hybrid learning used by high school students are laptops (46.2%) and mobile phones (53.8%). However, among the two, cellphones are more widely used because it is one of the electronics that may be owned by high school students.

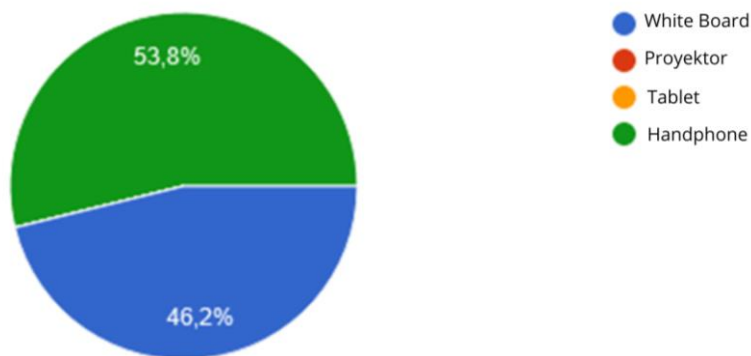


Figure 7: Media Used in Hybrid Learning System, 2021, Chart.
Source: Authors

Understanding of Learning Materials

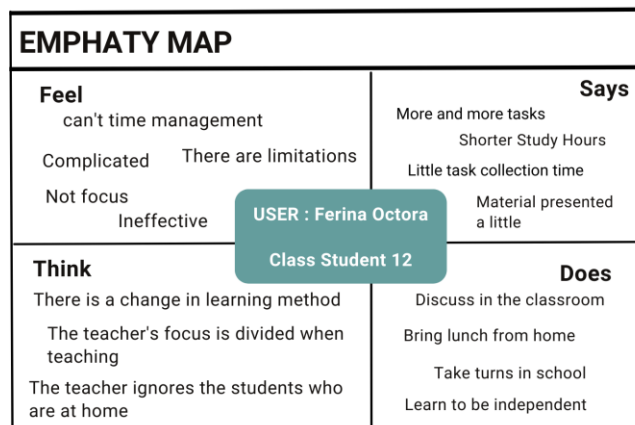


Figure 8: Empathy Map of Ferina Octora, SMAN 1 Tambun Selatan 12th Grade Student
Source: Authors

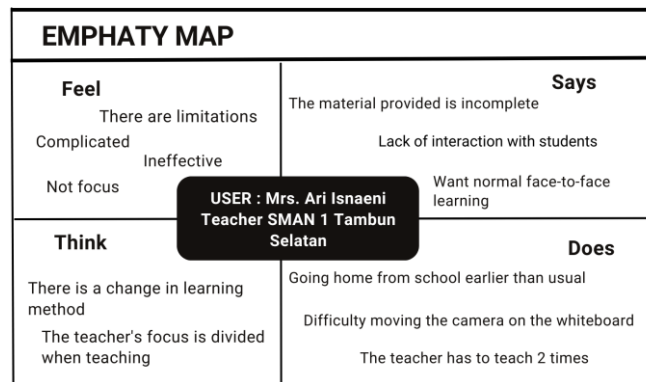


Figure 9: Empathy Map of Mrs. Ari Isnaeni, SMAN 1 Tambun Selatan 12th Grade Teacher
Source: Authors.

The learning system that turns into hybrid learning makes it difficult for students to adapt and makes it difficult for students to understand the material provided by the teacher because at the time of hybrid learning, students learn online and face to face alternately, which often when learning online students have difficulty understanding material other than In addition, the teacher who explains the material is also more focused on the students in the class and can affect their grades at school.

After conducting interviews with several students from grade 12 of SMAN 1 Tambun Selatan, according to Ferina Oktora, who is one of the 12th-grade students of SMAN 1 Tambun Selatan who interviewed, she felt that there was less material delivered during Hybrid Learning than during normal learning. According to her, Hybrid Learning is also unfocused and less efficient. the teacher explains that the teacher's focus is divided between students who are at school and at home, however, often due to certain limitations such as network problems, one of which makes the teacher focus more on explaining students who are in school. The teacher teaching staff from SMAN 1 Tambun Selatan, Mrs. Ari Isnaeni, said that with the Hybrid Learning method, the material provided was reduced due to limited class hours and school hours, so the teacher had to shorten the material, which resulted in reduced and incomplete material. Bu Ari also said that it was difficult for her to focus when teaching and felt that the Hybrid Learning method was complicated, less efficient, and inefficient.

Below is a graph from a high school student questionnaire, what subjects have an impact on this hybrid learning. On average, high school students choose Mathematics (6.15%), Physics (6.15%), and English (53%) as the impact of this learning.

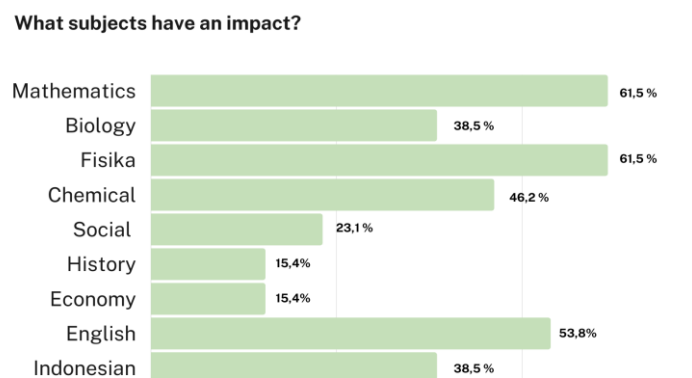


Figure 10: Most affected school subjects, Chart
Source: Authors.

In the graph about learning media that are more suitable and easily understood by high school students, listening to the teacher's explanation directly (92.3%) is the choice many high school students choose. Listening to the teacher's explanation directly is indeed easier to understand because if we don't understand, we can directly ask the teacher what we don't understand. However,

due to Hybrid Learning, where students are face-to-face in school and students are online at home, it makes students who are at home a little difficult to ask for lessons that they don't understand.

Learning media that is more suitable for you to use?

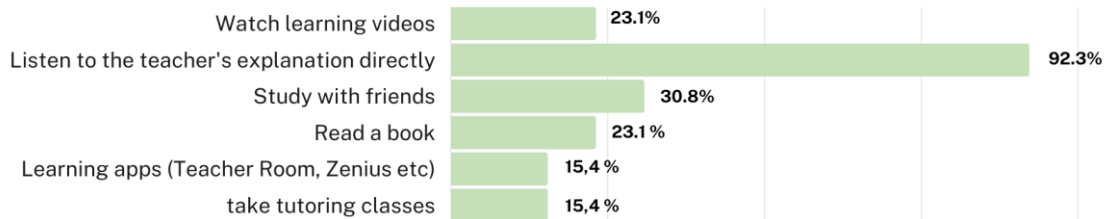


Figure 11: Suitable Learning subjects, Chart
Source: Authors.

The graph below shows that whiteboard media with a percentage (46.2%) is often used. The blackboard is one of the learning media that is always available in every school. Before the existence of this hybrid learning, the learning media used was the blackboard. Until now, the blackboard is still a learning medium that is often used. However, with hybrid learning, the teacher as an intermediary who provides knowledge for students must be able to use the blackboard for face-to-face and online students.

What media and devices are most often used by teachers to explain the material during hybrid learning?

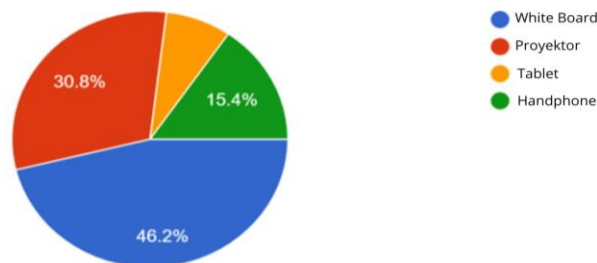


Figure 12: Suitable Learning Media, Chart
Source: Authors.

Psychological of Grade 12 Students

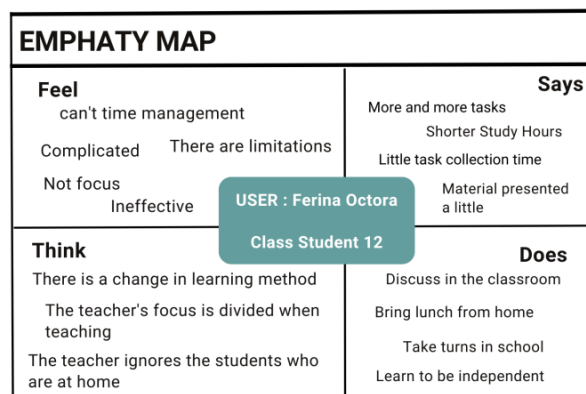


Figure 13: Empathy Map of Ferina Octora, SMAN 1 Tambun Selatan 12th Grade Student
Source: Authors

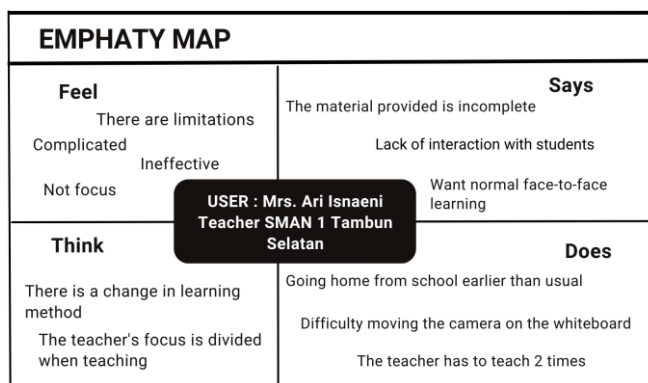


Figure 14: Empathy Map of Mrs. Ari Isnaeni, SMAN 1 Tambun Selatan 12th Grade Teacher
Source: Authors.

In addition to Academic Performance and Material Understanding, Psychology in grade 12 students has more burdens than lower classes such as grades 10 and 11. Grade 12 students will take the School Examination and want to continue to a higher level, for example, the college that must be prepared carefully. However, with this hybrid learning, grade 12 students are a little stressed with limited understanding, and discussions with teachers or friends are also limited. Good opportunities that can be done, such as discussing in class with the teacher or friends and providing mutual support/motivation, are difficult to do because this hybrid learning limits students from communicating with each other.

Ferina Octara, one of the students at SMAN 1 Tambun Selatan, feels that this hybrid learning makes her learn independently, making her have to understand the material, which of course, is not easy to understand without guidance from the teacher. That way, she must be able to concentrate and focus on the material she is understanding. Likewise, there are quite a lot of tasks that make her have to work extra. Usually, the teacher will provide material and give assignments in class and then do it together with friends, but because of this pandemic, they can only do assignments via message with friends at their homes.

This situation also happened to the teacher at SMAN 1 Tambun Selatan, Mrs. Ari Isnaeni. She said that this change in learning methods made her rethink how to provide suitable learning, get enough material, and of course, make students get satisfactory results or grades even though this hybrid learning provides limited learning time.

The graph below shows how high school students feel during hybrid learning. High school students choose the choices chosen mainly by lack of material presented (69.2%) and difficulty concentrating (69.2%). The lack of material shown can impact the psychology of students, where they have to learn independently and work hard to get other knowledge from other learning media such as Ruang Guru, Zenius, or tutoring classes outside. The difficulty of concentrating during hybrid learning is undoubtedly disturbing to the concentration of students doing online learning at home because noises at home or outside the house are certainly disturbing to learning concentration. Not being able to discuss or interact with teachers and friends is also one of the choices that high school students make. Discussing or interacting is very important because students can give each other motivation or opinions that make the mind more open and less tired after the learning.

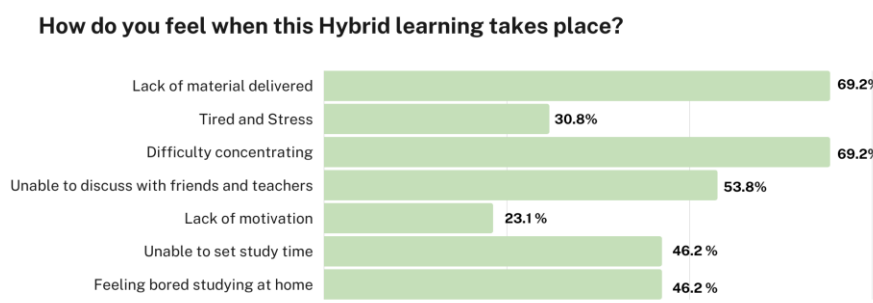


Figure 15: High school students feel during hybrid learning, Chart
Source: Authors

Conclusion

The hybrid learning method used as a learning method during this pandemic has changed the learning system, one of which is in Indonesia. This significant change in learning methods makes students and school teachers have to adapt quickly. Starting from the reduced learning time, the limited time to come to school, learn to be more independent, and communicate is one way to exchange views. High school students also said that the learning media that is often used and is easy to understand when the teacher explains is the blackboard media. However, because of this hybrid learning, students who do online education have a little difficulty seeing the blackboard when viewed from the zoom or google meet learning media. Students and teachers also have to adapt to devices such as laptops and mobile phones that can be used as teaching media such as zoom, google meet, and google classroom.

This research is still in its early stages, and we will use the results of this research as the basis for further research. The following research plan will discuss many ideas about tools that can help this hybrid learning run effectively related to the problems and issues in this paper. We hope that with this research, we can help solve this issue or problem with the tools we have designed according to the needs of this hybrid learning.

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