Smart Board Live Application: Super Complete Online Learning Platform for Effective Online Learning

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ABSTRACT
Online learning in Indonesia currently has many obstacles. Some of the obstacles are less supportive learning device, participants find it difficult to download various applications to support online learning, and the difficulty of educators when explaining calculation material and formulas online. So, we provide solutions in the form of user interface design in the application that we design, namely Smart Board Live. This paper is made using quantitative descriptive data and literature studies. The design of this application will provide all the features needed to support teaching and learning activities. In this application there are some menu; Live Board, Attendance List, Exam, Collection of Materials, Student Assignment, and Account. The Live Board menu is the main menu in the form of an interactive digital whiteboard that can make interconnect users, brainstorm, write, draw, visualize ideas, record, share documents, and share editing and additions made on the board.

INTRODUCTION
The future of Indonesia is determined by the excellence of human resources in understanding and mastering the mechanism of development and application of science and technology. Therefore, we strive to participate in developing and applying science and technology in the field of Education. Education is very important to create a superior and quality of human resources. Current technological developments not only provide students with alternative learning options, but also give educators challenges in making learning more innovative, choosing learning models, and making appropriate learning media (Wijayanti & Hasan, 2018).

The role of technology is very helpful in the field of Education, especially in the current condition of the Covid-19 pandemic. The government seeks to perform various countermeasures to avoid the transmission and dissemination of the Covid-19 pandemic. The decisions established by the Indonesian Government is the policy of working, worshiping, and learning from home, face-to-face learning is transformed into online learning (Direktorat Jenderal
Online learning is a learning process that uses the internet as a place to channel knowledge (Rachmat & Krisnadi, 2020). The utilization of information and communication technology is needed to support online learning.

Nowadays there are many kinds of applications that come with various functions and its function in supporting the learning process. Some applications that are often used are Zoom Cloud Meeting, WhatsApp, Google Classroom, Schoology, and others. Schoology is one of the innovative platforms that was built based on inspiration from Facebook with the aim of educational interests developed in New York in 2009. Schoology features facilities to create learning classes called courses, groups, or task groups, learning videos, discussions, and other learning resources. Google Classroom is almost the same as Schoology where Google Classroom has features that can be used in the learning process including the main page that can display student assignments, class preparation, data storage on Google Drive and can be accessed via a smartphone and can also accommodate a wide range of files. WhatsApp is a very widely used communication tool that is equipped with group creation to exchange information and discussions to support education by way of discussion and delivery of material with an audio file and text distribution. Zoom is an application that can be used to perform the learning process in a virtual face to face way.

However, the application also has its flaws. In Schoology and Google Classroom applications cannot do face-to-face learning, WhatsApp number of people in the group is restricted and can’t do online face learning for the number of people more than eight, while the Zoom Cloud Meeting application, requiring enough internet quota to access learning, and not yet equipped with task collection or sharing material features. In those applications, there are also no additional features such as online whiteboards that can be used to help the teacher in explaining the materials.

The submission of materials that only uses theory, most participants can understand the learning easily with explanation only. But for students who work on subjects with an exact learning in the field of systematic formulas such as physics, chemistry, and mathematics it is difficult to understand learning if only explained by words. Because, when learning to use Zoom, WhatsApp, Google Classroom, Schoology, an educator only provides material in the form of PowerPoints. Whereas usually at a direct learning meeting a whiteboard is needed that is used by educators as a media to explain the description of the systematic formula so that students can more easily understand it. Educators also find it difficult to explain the calculation material online without a whiteboard. Then, with a wide range of applications that provide a variety of features as mentioned earlier, creating learners and educators must download many applications to be able to use those features. Thus, this raises a new problem, which is full phone memory and limited quota. Coupled with the complaints of students who missed the material while studying online due to an unstable signal.

Based on the explanation above, there are two problem formulations, namely; (1) How to increase students' understanding of the material explained by the teacher online, especially the calculation material? (2) How to overcome the problems of signal, quota, and full phone memory when studying online? So, we give an idea to design an application that can cover all the online learning support features. Thus, all the features needed in the online learning process can be accessed through only one application, ranging from media presentations, videos, discussion groups, task collection, absences, and smart whiteboards will be available in this application. The idea of this online learning platform is called the Smart Board Live Application,
which can give the impression of online learning as if studying in a classroom. Through this application, educators and students can be connected and do the teaching and learning process without being limited in time and space. The concept of this application is to combine features in Zoom, Schoology, and Interactive Whiteboard into one application that can be accessed easily. So, educators and students do not need to download various applications to do online learning but simply download one application. Online learning will be more effective, efficient, and interactive.

The purpose of this paper is to convey ideas in the form of an application design that is Smart Board Live. By presenting this idea, it is hoped that it will be useful to (1) Give a reference in making learning application design that can provide various features of support in online learning. (2) Help educators to deliver the material. (3) Help students to better understand the material presented. (4) Create a more effective and interactive teaching and learning environment.

METHODOLOGY
This paper is written in the form of ideas as a solution to overcome problems that occur. The analysis conducted on this paper is based on quantitative descriptive data using survey methods, which are conducted online (Sugiyono, 2017) as primary data collection and literature study as secondary / supporting data. Primary data collection in this study was carried out by distributing questionnaires online to 50 respondents who conducted online learning in the environment of the Physics Education Study Program Faculty of Teacher Training and Education of Sriwijaya University. Data obtained through the filling of the questions shared with all respondents in the form of Google Form on link https://bit.ly/KuisionerSmartBoardLive1 and https://bit.ly/KuisionerSmartBoardLive2. Then the data collected is analyzed to be described.

The components of the questions in the questionnaire consist of preferred questions and also opinions, the questions are as follows:

1. How does the understanding of the material you get from the online learning process especially for the discussion of systematic formulas? a. Easy to understand. b. Difficult to understand;
2. What were your complaints during online learning? a. Lack of detailed explanation through interactions like on the whiteboard. b. Delivery of material that is less than the maximum. (3) Should a learning application provide whiteboard digital be made? a. Yes. b. Not;
3. Constraints do you feel while studying online? a. The device does not support it. b. Other opinions;
4. What is your opinion if an application is made with complete features that serve you like in the conventional class? a. Strongly agree. b. Agree. c. Other opinions;
5. If given a range of 1 to 3, how much do you need the Smart Board Live application or teaching whiteboard with the added features of online presentation, face-to-face, assignment collection, etc.? a. 1 (not important) . b. 2 (less important). c. 3 (very important); (7) Do you feel difficulties when having to download various types of applications for online learning? a. Yes, b. No; (8) If Yes, what reasons make you feel difficulties? a. limited memory mobile and internet quota b. Limited internet quota c. Mobile memory is limited.

RESULT AND DISCUSSION
Demographic Information from Survey and Literature Studies
Based on the results of a survey of 50 Physics education students at the Teaching and Education Faculty of Sriwijaya University obtained the following data:
Figure 1. Question 1: (How does the understanding of the material you get from the online learning process especially for the discussion of systematic formulas?)

Figure 2. Question 2: (What were your complaints during online learning?)

Figure 3. Question 3: (Should a learning application provide whiteboard digital be made?)

Figure 4. Question 4: (Barriers that you feel when studying online?)
Figure 5. Question 5: (What is your opinion if an application is made with complete features that serve you like in the conventional class?)

Figure 6. Question 6: (If given a range of 1 to 3 how much do you need the Smart Board Live application or teaching whiteboard with the added features of online presentations, face-to-face meetings, assignments, etc.?)

Figure 7. Question 7: (Do you feel difficulties when having to download various types of applications for online learning?)

Figure 8. Question 8: (If Yes, what reasons make you feel difficulties?)

Based on the overall data shown above we can see that 92% of students have difficulty in understanding material related to systematic formulas during online learning (Figure 1), 64.7% of students experience obstacles when understanding material due to lack of detailed explanation.
through interactions such as on the whiteboard (Figure 2), 54.9% of students complained about the lack of supporting device features to explain material related to the formula and 45.1% complained about quota constraints and unstable signals during online learning (Figure 4), 98% of students said that they very much expect an application that provides interactive whiteboard features to support the explanation of material from educators (Figure 3), and 50% of students also find it difficult to download various online learning support applications due to constraints on mobile memory and limited internet quota (Figure 8).

The conditions of online learning in high school students are also not so different from the conditions of online learning in the university. Based on research conducted by Rachmat & Krisnadi (2020) at SMKN 8 Kota Tangerang with 88 respondents consisting of classes X and XI obtained data that 69.3% of students choose to learn online using the Google Classroom application and 97.7% of them use gadgets as a medium for accessing learning applications. The results of students having online learning are that 59.1% of students say that they lack an understanding of the material generated during the online study, 1.1% admitted that they do not understand anything about the material described. At the effectiveness assessments of online learning, 56.8% of students consider that the less effective online learning they have been doing, and 4.5% have stated that online learning is not effective.

Research at the Sunan Gunung Djati State Islamic University in Bandung conducted by Hikmat et al, (2020) of 100 respondents from students found that only theoretical courses could be carried out online learning effectively. Students also hope that the effects produced in online learning must be equivalent to conventional learning (Hikmat et al., 2020).

Then, it can be concluded that students need adequate tools to support online learning to make it easier to understand the material being taught, especially material that contains an explanation of the formula. They also expect online learning that is equivalent to conventional learning (Hikmat et al., 2020). Therefore, we strive to find solutions based on problems that have occurred. The solution we offer is the creation of a whole package application, which means that all the required online learning features can be accessed at once in just one application. Thus, its use will be more effective, efficient, and interactive. We initiated the Smart Board Live Application idea, which includes various features such as those available in the Schoology application, features like the Zoom application, and supported by the Smart Whiteboard feature, so that teachers can write freely as if they were writing on the blackboard in class. So, we can present an online class like a conventional class in the real world.

The Effectiveness of Online Learning Through Several Applications Currently Used Frequently

Several application recommendations that can be used to do online learning, including Zoom Meeting and Google Meet to do audiovisual learning, LMS (Learning Management System) and Google Classroom for uploading learning material and conducting virtual classes, WhatsApp for conducting online discussions, and Google Form to attend students attendance and quizzes (Politeknik Negeri Malang, 2020).

The availability of various applications that can be used to support online learning does not fully help the educator to convey the material well and can make participants understand what is explained. One factor is the lack of features in the application that provides whiteboard media to become a media intermediary for teachers in writing and delivering material. The attention of
students who are usually focused on the teacher, the whiteboard, and the projector screen when studying in class cannot be fully obtained when studying online.

The teaching and learning process in the classroom is identical to the whiteboard. Educators will write and draw many things on the board to give a more detailed explanation. However, through online learning, teachers cannot freely and flexibly write material, add additional information, and emphasize important points on the presentation media as the teacher can write them on the whiteboard in class. Thus, when online learning the center of attention of students is only focused on the power point or even only focused on the teacher who is explaining the material with the lecture method. That is if they use it, it makes it easier for learners to get drowsy and lose focus while learning which has an impact on their level of understanding of the material.

The lack of supporting features such as whiteboard creates its problems when it comes to teaching material relating to the translation of formulas. This was felt directly by the respondents from students (Figure 3.3). Based on the results of the study, online learning methods specifically for Physics Science subjects pose its problems, namely the difficulty of explaining formulas and material calculations without face-to-face between instructors and students who cause students difficulties in understanding the Physics science learning materials (Napsawati, 2020). These deficiencies can be minimized by making interactive whiteboard features on learning applications, so that teachers can write through interactive whiteboards as if writing on a whiteboard in class. Effective learning is characterized by students’ success in achieving learning goals, providing an attractive learning experience, actively involving students, and having facilities that support the teaching and learning process (Limbong & Simarmata, 2020).

At present, online learning is more effective for theoretical material, whereas for material that contains calculations and formulas is considered less effective by educators and students. Means, applications that are often used today, such as Zoom, Google Classroom, and WhatsApp cannot provide the same effectiveness in every subject. The use of such applications, such as Google Classroom as online learning media is good and quite effective for theoretical material, but it would be better if combined with other online learning platforms (Suhada et al., 2020). Therefore, the development of features in learning applications is needed to improve the effectiveness of online learning for all subjects.

Interactive Digital Whiteboard

An interactive whiteboard is a medium for writing, drawing, and visualizing ideas through a touch screen device. Initially, an interactive whiteboard was an electronic whiteboard device connected to a computer network and a projector screen (Al-Qirim, 2011). However, at this time interactive whiteboard or commonly known as a smart whiteboard can be used without having to have a large whiteboard screen, enough with the mobile devices that we have. Today’s interactive whiteboards are digital-based, so they can be accessed easily through various devices such as laptops, tablets, and smartphones.

Some research, in making digital whiteboards, uses WPF (Windows Presentation Foundation) which is very interactive and built using a programming language (Sutanto et al., 2018). In making the application Android Studio can also be used. Android Studio is an IDE (Integrated Development Environment) that is used for developing Android applications. Android Studio features an intelligent code editor (Intelligent Code Editor) that has advanced code completion, optimization, and code analysis capabilities. Various new modules are used in this Android Studio, one of which is the development of a multi-screen application that makes it easy to develop an application for mobile phones and tablets.
A combination of interactive whiteboards with learning features such as discussion rooms, chat columns, video calls, audio, quizzes, absences, and material collection places on an online learning platform is urgently needed. The blackboard makes it easier for teachers, especially those who teach in the field of science, to be easier when they have to explain calculation material and formulas. Thus, the application learning platform is very helpful in doing online learning for all subjects in school.

The benefits of using this interactive whiteboard have been recognized by teachers and students (BECTA, 2004). Based on the development of technology, the advantages of interactive whiteboards include the uniqueness of the blackboard (Haldane, 2007), its capacity as a tool to build educators (Bell, 2002), and have a positive influence on learner's behavior in learning (Mildenhall, et al., 2008).

Interactive whiteboards have the potential to increase interaction in learning, especially in increasing student motivation, their involvement in learning, and connecting between students, learning resources, and ideas (Northcote et al., 2010). In the teaching and learning process, educators must stimulate students' curiosity about the material taught so that students can continue to be interested in listening to explanations and always digging information. Educators must provide information in the form of text, audio, and video because each child has a different way of learning by providing stimulus material in the form of text, audio, and video is expected that all children can absorb the information provided properly. Currently, technology has an important role that can be implemented to support educators in conveying information and getting information in text, audio, and video (Benoit, 2018).

Several features must be present on a digital whiteboard, namely: (a) there are various types and colors of pencils to write on the board, (b) the application can be run with an internet connection, (c) can save files after discussion by teachers in online classes, (d) students can work in a stimulant manner the same interface, without disturbing other students, (e) students can update the answers periodically in their respective application workspaces (Sutanto et al., 2018).

**Important Elements in Mobile Learning**

Our Smart Board Live application has a mobile learning concept. The concept of mobile learning is a learning model that utilizes information and communication technology that provides learning material that can be accessed at any time and interesting material visualization (UNY, 2010). The benefits of mobile learning can provide unlimited learning space and time, can support learning literacy, numeracy, and language, provide learning experiences to students individually and collaboratively, and can help students to be motivated in learning.

There are three important aspects of mobile learning, namely; aspects of the device, aspects of the learner, and social aspects. Aspects of the device include physical devices, techniques, and their use (Menon & Steinhoff, 2019). The learner aspect is a picture of the motivation and desire of students to adapt to new information, new tasks, and the ability to master information in the long run (Koole, 2009). This aspect of the learner needs to be considered as a guide to making a learning device by the needs of the learners themselves. An online learning application or platform must support students to learn in various ways (Menon & Steinhoff, 2019). Social aspects are aspects that focus on social interaction and communication (Koole, 2009).

Implementation of online learning must be held with; (1) Learning independently and guided by utilizing ICT, (2) Using digital teaching materials combined with other teaching
materials, (3) Utilizing ICT-based learning media, (4) ICT-based learning interactions by minimizing direct interaction (Direktorat Jenderal Pendidikan Tinggi, 2020). Therefore, it is very important to pay attention to three aspects of mobile learning to be able to make applications according to needs.

Table 1. Design Features of the Smart Board Live Application

<table>
<thead>
<tr>
<th>Device Aspect</th>
<th>Learner Aspect</th>
<th>Social Aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portability and Accessibility</td>
<td>Level of Interactivity</td>
<td>Communication between students to students</td>
</tr>
<tr>
<td>Storage Information</td>
<td>Model Development Tools</td>
<td>Learning Community</td>
</tr>
<tr>
<td>Information Collection</td>
<td>A practical device, can access</td>
<td>Be sensitive to surrounding problems</td>
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<tr>
<td></td>
<td>information in the form of text, video, animation and simulation</td>
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</tbody>
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Users Interface Design of Smart Board Live Application

Figure 9. Front Screen Display Application  
Figure 10. Display Login on Application  
Figure 11. Application Menu Display  
Figure 12. Display Tools on the Live Board Menu
The online learning application that we designed has several menus namely; Live Board, Attendance List, Student Assignment, Collection of Materials, Exam, and, Account.

The Live Board menu is an interactive digital whiteboard menu that is not only designed to be able to write, draw, and visualize ideas but has a function to build visual collaboration between users. So, by opening the Live Board menu in this application, users can connect, work together, explain each other, exchange ideas, share distance, draw sketches, add annotations and descriptions to images, and can share recordings and share edits and additions on the board.

The Attendance List menu is an absent menu for students, so educators can simply set up an attendance list on this application without having to make use of another platform. The Student Assignment Menu is a place for students to see and collect their assignments so that the collection will be more organized and scheduled. The Collection of Material menu is a menu provided for storing material that has been submitted by the teacher, so students can access the material delivered anytime and anywhere. Thus, students are not burdened with signal problems. The Exam Menu is a place for students to take exams and a place to make exam questions for educators. The Account Menu is a place for users to set profile views.

CONCLUSION

The quality of learning outcomes of students learning online must be the same as when learning directly. Important things needed to support online learning are tools or platforms. Based on the data obtained by several obstacles encountered during online learning are educators who have difficulty when having to teach materials related to calculations and students have difficulty when having to download various applications to get supporting features when studying online.
Therefore, we provide solutions in the form of user interface design in Smart Board Live application which provides all the features that support online learning tailored to the needs of the users. So, students and teachers no longer need to download a variety of applications, just by downloading one application. The design of application that we created is also an application that can save quota and can be accessed at any time so that if there is a signal constraint when learning online, participants can still access the material described when they get a good signal. This application is expected to be able to build virtual collaboration effectively and efficiently. Through this idea, to realize the Smart Board Live application requires collaboration from various parties from various fields such as; education, technology and information, coding, design, and marketing.

REFERENCES


