Bopens: An Interactive Media to Help Students in Remote Areas During Pandemic

Yuni Hartati Eliya Rosa1*, Alfatih Mutiasa Praja1, Nur Zahwa1
1Sriwijaya University, Palembang, Indonesia
Email: elsiyuni@gmail.com

ARTICLE INFO

Article History:
Received Date: 1st April 2021
Received in Revised Form Date: 10th April 2021
Accepted Date: 15th April 2021
Published online Date 01st May 2021

Key Words:
BOPENS, e-Pens, Interactive

ABSTRACT

Decree of the Minister of Education and Culture RI Number 4 of 2020 Regarding the Implementation of Education Policy in Period Emergency Spreading Corona Virus Disease (Covid-19) so that the learning process starts from the level of Paud up to college doing online learning. However, not all students stay in remote areas can take part online learning this is due to limited internet access and electricity. Therefore to help the learning process continues, the authors provide an audio based interactive learning media BOPENS (book e-Pens) pen (e-Pens) on SAINTEK material that can help students understand learning materials at home with facilities complete audio explanation of the material, discussion of practice questions, MP3, and Recording.

Copyright © Yuni, 2021, this is an open access article distributed under the terms of the Pancaran Pendidikan Journal license, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited

INTRODUCTION

Education is one of the platforms to provide change and progress for a nation. In realizing these changes can not be separated from the name of the learning process. The learning process is essentially a process of communication or the process of delivering messages from the educator's message sources through certain media to the recipients of students' messages (Setyawan, 2017). In learning activities the message that will be communicated is the content of the teachings or material determined based on the applicable curriculum. According to Florence Y. Odera in (Purwono, et.al., 2014) that the media can integrate students into learning experiences, explain and describe the content of lessons and performance skills in addition to providing opportunities for self-analysis of individual performance and behavior. So that one of the demands in the process to improve the quality of learning is to improve and improve learning strategies such as by providing new innovations in effective learning media to students in an effort to facilitate the transfer of knowledge and also easy for students in understanding
learning material. Based on the decision of the Minister of Education and Culture Republic of Indonesia Number 4 Year 2020 regarding the Implementation of Education Policy in the Emergency Period of the Spreading of Corona Virus Disease (Covid-19) which stated in the circular that the teaching and learning process must be done online to prevent transmission of the corona virus. This makes all teaching staff from PAUD to the tertiary level have to change the way they teach and create new models and learning media. But it is unfortunate that almost all areas of the learning village at home just don't work with this plan being influenced by the many inhibiting factors. As information obtained from the Kompas news media edition published May 5, 2020, students at SMP in Heso Hamlet, Golo Wune Village, Poco Ranaka District, East Manggarai Regency, NTT, difficulties in joining the "Learn from Home" program because they don't have televisions and smart phones. Not only students who do not have smart phones and television alone are other factors that are inhibiting such as slow internet networks and frequent power outages. This actually becomes an obstacle for every student who wants to learn. On the other hand also the large number of uneducated parents makes it difficult for a student to understand learning independently when learning facilities at home are not supportive.

From some of these problems, an offline audio learning media is needed to support the learning process at home for students. One of the media that can be used independently without using the internet and involves the sense of sight and hearing is audio-visual media. Absorption and memory of students can also increase in understanding the material if it involves the two senses (Daryanto, 2010). E-pens which is an electronic device in the form of a pen that can output sound / audio using a sensor system on an image. Based on the results of the thesis (Ramadhan, 2017) that the application of the media of al-quran pen (Al-Qolam) to the subjects of the Qur'an the Hadith can improve understanding of student learning materials. Moving on from previous studies and studies literature the authors propose a design by providing innovative learning media BOPENS (Book e-Pens) interactive which will be applied to SAINTEK subjects (Mathematics, Chemistry, Biology and Physics) as learning media during a pandemic for students in remote areas who do not have internet access and online television learning in preventing infection from the corona virus.

The purpose of this paper, namely to convey the ideas of an offline learning media design namely BOPENS (Book e-Pens) Interactive By conveying these ideas, the authors hope to be useful to: (1) Assist participants in understanding the SAINTEK material for students living in remote areas who do not have internet access and electricity that often goes out. (2) Making it easy for participants and educators to conduct learning only by providing study guides. (3) Reducing costs for people in the lower middle class compared to online learning.

**METHODOLOGY**

This paper is written in the form of ideas as solutions to existing problems and existing circumstances. The analysis used in this paper is a qualitative descriptive analysis using survey methods. According to (Gunawan, 2017) survey is one way to gather information from a number of people from a particular topic or topic. Survey conducted by distributing Goggle Form questionnaires, online (Sugiyono, 2017).
Sources of data collection consist of primary and secondary data. In the primary data using the Goggle Form questionnaire distributed to the population of high school students throughout the area in order to obtain the data needed, then this data will be analyzed and described to obtain answers to questions. As for secondary data, a study was conducted literature from various sources of books, articles, news and journals to support and refine this scientific paper. There are 8 questions in the Goggle Form (bit.ly/KuesionerQuestionKtiForkom2020) and 63 respondents from various schools in the area. The flow chart of the framework of thought:

RESULT AND DISCUSSION
Potential and problems are the main thing to do before collecting data to make teaching materials. This problem arises when there is a change in the learning situation from offline to online due to a pandemic situation that is endemic throughout Indonesia. This problem is also seen in the area around researchers, many students who have difficulty in accessing learning. This is also supported by the distribution of questionnaires to ensure the need for alternative learning media innovations during a pandemic. Where based on the results of filling out the questionnaire as much as 80.95% of the 63 respondents from various regions answered yes, they found it difficult to follow the online learning system.

Figure 2. Question 1 (Do you have the difficulties when studying at home?)
**Figure 3.** Question 2 (What obstacles do you often experience when studying at home?)

The student's obstacles when studying at home

- Do not have a Smartphone: 0.00%
- Do not have internet quota: 15.13%
- Bad network: 29.41%
- Electricity often goes out: 26.35%
- Lack of understanding of material: 26.35%
- Others: 5.04%

**Figure 4.** Question 3 (Do you need alternative learning media when studying at home?)

The student need of alternative learning media when studying at home

- No: 6.35%
- Yes: 93.65%

**Figure 5.** Question 4 (Which type of media do you like or can improve your enthusiasm for learning?)

Type of media the student's like

- Audio-Visual: 60.32%
- Visual: 26.98%
- Audio: 12.70%
Yuni: Bopens: An Interactive Media to Help... 19

**Figure 6.** Question 5 (What type of learning media that using e-Pen system can increase your interest in learning process?)

**Figure 7.** Question 6 (Are you interested if there is an innovation in BOPENS (Book Pens) as a learning medium to help you study at home?)

On 13 April 2020 the Minister of Education and Culture (Makariem, 2020) launched a learning media learning program from home using television as an alternative to online learning. But this still remains a problem for students who live in remote areas. This can be seen from the survey results about the obstacles that often occur in students 36.97% lack understanding of the material in online learning, 29.41% are constrained by bad signals, 15.13% do not have internet quota and 5.04% others. The obstacles that are often experienced by students vary regarding online learning. In addition, learning that cannot be played repeatedly on television programs makes it difficult for students to understand the material. While, students need an audio-visual media that can support their learning process. Audio visual media that displays the reality of the material can provide real experiences to students when learning so that it encourages self-activity and can learn independently without supervision (Rachman, 2017). The use of audio in learning can also improve the memory and memorization of students, while the use of visual learning in learning will be interesting, effective and efficient (Rosidah, 2016).

Based on thesis research (Ramadhan, 2017) entitled "The Application of Al-Qolam Media to Improve the Ability to Memorize Class VIII Students On Subjects Al-Qur'an Hadith in Madrasas Tsanawiyah Paradigm Palembang ". The results of his research stated an increase in memorization of students using learning media compared to without an audio talking pen, which means that learning using talking pen is very influential on the understanding of students learning. Also supported on the results of
research (Vickyriansyah, 2017) states that the ability of students to read the Qur'an after using the media Talking Pen in Class VIIA MTs Babussalam Kumai Kotawaringin Barat District with the acquisition of an average score of reading the Koran after using the media Talking Pen in class VIIA MTs Babussalam Kumai is 63.74 at 61-80 intervals. Thus overall the ability to read the Qur'an in class VIIA MTs Babussalam Kumai is in the good category. The use of a media in learning can also arouse new desires and interests, increase motivation and stimulation of learning activities, and even influence psychologically on students (Hamalik, 1986). So the level of understanding of students to learn audio-visual is easier to remember. Based on this research the authors also provide new innovations and modifications regarding learning media in this pandemic era with BOPEN media (Book e-Pens) as a learning media that can help all children in remote areas to understand the subject matter easily through e-pen that will produce sound explanations about science learning materials or science so as to increase understanding of the material by learning alone at home.

Based on data collection and study literature that has been done with surveys, then e-pen based learning media designs are made by looking at the components of e-pens through a prior research journal. The design of BOPENS will be made on 4 subjects which are often problematic in understanding the material for students living in areas such as mathematics, physics, biology, chemistry and biology. This begins with the collection of learning materials in accordance with KD, KI and learning objectives that are published and arranged according to the syllabus of lesson plans. Then proceed with designing books and making e-pens. In making e-pen, audio recording of the teacher is done which explains the learning material. Making audio material includes explanations of material, pictures, example questions, evaluation of answer questions and glossary of words. The purpose is structured like that so that students easily understand the material by listening to an explanation through the audio pen. Where the explanation on the audio can later be repeated if you still do not understand the material like a student is in class listening to the teacher's explanation. The e-pen is also accompanied by interactive questions when the audio is explained. Where through the question feed will also train students to think critically. How to use Where through the question feed will also train students to think critically. How to use Where through the question feed will also train students to think critically. How to use e-pen enough to touch e-pen on the cover / page of the book and e-pen will process the audio file to be read then a voice will sound, then e-pen ready to use. Based on Gerlach and Ely in (Arsyad, 2007) said that the media when understood broadly are human, material, or events that build conditions that make students able to obtain knowledge, skills, and attitudes. Based on the results of the questionnaire obtained that more than 50% of respondents need audio-visual media. In this BOPENS media learning can also be done repetitively just by pressing the button. According to Atkinson and Shiffrin (Matlin, 1998), repeating in the heart can safeguard information so that it can survive in short-term memory.

Biology material that contains explanations about pictures and graphics of students can direct epen to the part of the image that will automatically make a sound about the process and what happens in the picture while the mathematics, physics and
chemistry for the exact sciences can explain how solve the problem that can be heard through audio and students will see visually in the book about the numbers explained by the teacher. This silent audio-visual based learning media can be said to have innovative and creative aspects in creating a learning atmosphere. This media can also improve students' understanding and memory in receiving learning material delivered. E-pens which includes an electronic device in the form of a pen that can output sound / audio using a sensor system on an image. Currently e-pens has been developed into several media including digital Koran and books for toddlers and children. In addition, how to use e-pen also not difficult.

The design of BOPENS (Book e-Pens):

![Figure 8. (a) Front view of the book, (b) Display contents of BOPENS Mathematics](image)

![Figure 9. (a) Display contents of BOPENS biology, (b) Display contents of BOPENS Chemistry](image)
Figure 10. (a) Front view of e-Pens button function components, (b) Back View of e-Pens, (c) Side View of e-Pens

BOPENS (Book e-Pens) which is an audio-visual based learning media innovation consisting of books and pens. The book is designed as a supporting book for high school students in subjects such as Mathematics, Physics, Chemistry, and Biology (SAINTEK), this book not only provides learning material but also contains a question bank that can help students hone the material described. Then this book will be printed using special ink so that it can be read from e-pen used. While the draft e-pen which will be used to have complete audio facilities, material explanation, question practice discussion, MP3, Recording and use a dry battery and can charge electricity. The existence of a guidebook for the use of BOPENS makes it easy to carry out the learning process independently.

The strengths and weaknesses of BOPENS, such as:
Table 1. The strengthness and weakness of BOPENS

<table>
<thead>
<tr>
<th>Strengthness</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Innovation of new learning media for application to SAINTEK science students</td>
<td>1. Tests are needed from the experts in the media, material and others</td>
</tr>
<tr>
<td>2. Silent Audio Visual Learning</td>
<td>2. The manufacturing process requires a long process</td>
</tr>
<tr>
<td>3. Easy to use for students</td>
<td>3. The price is rather expensive</td>
</tr>
<tr>
<td>4. Does not use electricity and costs a lot</td>
<td></td>
</tr>
<tr>
<td>5. The language of the book and the explanation is easy to understand</td>
<td></td>
</tr>
<tr>
<td>6. E-Pens can use batteries or electric batteries</td>
<td></td>
</tr>
<tr>
<td>7. Audio records can be heard repeatedly</td>
<td></td>
</tr>
</tbody>
</table>

BOPENS learning media will be used for high school students in all corners of the region. Where in making this learning media innovation do collaboration between teachers, parents, education offices, government, health and the production: (a) Teacher. The teacher is the person who plays an important role in conducting learning in the classroom, therefore teacher cooperation is needed to be able to implement it by giving students an understanding of the procedures for using it and explaining what students should do about the learning media, (b) Education and Government Service. In an effort to improve the quality of education and understanding of students towards the material in a pandemic situation. So the Education Office in each region requires collaboration with schools, media training centers PUSTEKOM RI, KEMENDIKBUD RI and PT Mandiri.id in helping to process the implementation of manufacturing e-Pen audio and books. It is hoped that with this idea, it can help students who live in the area to be able to enjoy the learning process even though living in an area that is difficult to access the internet and television. (c) Parents of Students. To support the implementation of this BOPEN learning media, parents also need to know how to use it and guide children in their homes to help improve understanding of learning materials using BOPENS.

CONCLUSION

Based on the results of the analysis using research data obtained from surveys and interviews it can be concluded that the majority of high school students living in the area find it difficult to participate in learning activities at home during the Covid-19 pandemic. The constraints that hamper this learning activity are due to inadequate signal and internet factors in some areas. Therefore, we need an innovative learning media that can be used in a manner offline so that it can support learning activities at home.

BOPENS (Book Pens) is an innovative learning media designed in the form of audio-visual books and digital pens. The book is designed as a supporting book for high school students in subjects such as Mathematics, Physics, Chemistry, and Biology (SAINTEK), this book not only provides learning material but also contains a question bank that can help students hone the material described. Then this book will be printed using special ink so that it can be read from e-pen used. While the draft e-pen which will be used to have complete audio facilities, material explanation, question practice discussion, MP3, Recording and use a dry battery and can charge electricity. This innovation is very effective as a support for learning activities of students who live in the area without being hampered by various external factors of learning online.
REFERENCES


Rachman, R. N. (2017). *Improving Short Story Writing Ability Through the Use of Impressive Audiovisual Media Television”Mirror of Trans 7 Life”*. *Jurnal Diksatrasia, Volume 1, No. 1*.


Vickyriansyah, M. A. (2017). *The Relationship of the Use of Talking Pen Media to the Ability to Read the Koran in Class VIIA MTS Babussalam Kumal Kabuaten/West Waringin City*. Palangkaraya: Faculty of Tarbiyah and Teacher Training at the Palangkaraya State Islamic Institute (IAIN).