The needs analysis for the development of electronic learning module (e-module) based on local wisdom information search in senior high schools’ physics online learning during COVID-19 pandemic

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Abstract. COVID-19 outbreak is a new global problem in 2020 which has a significant impact on education, one of which is the change in learning methods because all activities are using online learning right now. This causes the teacher to provide appropriate learning media in assessing student competence following national learning objectives. The purpose of this study was to determine and analyze the needs of teachers in developing learning media in the form of electronic modules (e-modules) based on local wisdom with the type of information search to empower students' critical thinking skills and character values in online learning activities during the COVID-19 pandemic. This type of research is descriptive research. Data collection techniques using questionnaires and interviews. Research subjects were 20 physics teachers from several Senior High Schools in Soloraya (Surakarta City and surrounding areas). The results showed that 95% of teachers needed an e-module media development based on local wisdom type information search to empower critical thinking skills and student character values during the situations of the COVID-19 pandemic.

Keywords: character value, covid-19, critical thinking, local wisdom, the needs of learning media.

1. Introduction

At the beginning of 2020, the world was shocked by the outbreak of a new virus, namely the new type of coronavirus (SARS-CoV-2) and the disease then called Coronavirus Disease 2019 (COVID-19) [1]. COVID-19 is a new outbreak that causes global problems [2]. The COVID-19 was first found in Wuhan City, Hubei Province, China [3]. In December 2019 COVID-19 attacked Wuhan city where the number of cases increased rapidly but the clinical information of infected patients was limited [4]. Due to rapid global spread, the World Health Organization (WHO) then announced the COVID-19 outbreak as a pandemic on 11 March 2020. By August 18, 2020, there were more than 22 million people infected and more than 700,000 people died due to this virus infection across the globe [5]. In general, this disease is clinically characterized by respiratory symptoms [6].

The impact of the coronavirus or COVID-19 pandemic has been felt in various aspects of life in Indonesia [7]. The ongoing economic and social impact of the pandemic is staggering, a lot number of companies deactivate their employees. In Indonesia, the household sector is the most economic sector impacted by the COVID-19 pandemic [8]. The massive spreading of the virus made the government...
issue social distancing and physical distancing policies to prevent more widespread transmission of the virus. This policy is enforced nationally so that it does not only affect areas directly exposed [9].

One negative impact of the corona outbreak is its effect on the education system [9]. The government through the Ministry of Education and Culture issued Act number 3 of 2020 concerning COVID-19 prevention by dismissing education units and universities nationwide. Other impacts also change the method of learning, from the initial learning done directly (face to face) changed to online learning starting from elementary school level to college [10].

Learning is a human initial nature that distinguishes humans from other lower creatures. More specifically, the learning means a process carried out by individuals to get a new behavior change either in whole or only in part, as a result of the individual's own experience in interaction with his environment. Learning for a student is an activity to process the information received which is carried out intentionally and consciously. Distance learning is a policy taken by the government to reduce the level of the spread of the Coronavirus during the pandemic and New Normal era [11]. Distance learning has the principle of communication between students and their tutors from a certain distance. Distance learning can be more effective when we utilize e-learning with the help of electronic media such as smartphones, computers, and laptops [12, 13].

Online Learning System is an implementation of distance education that aims to improve equal access to quality learning [14]. Some studies suggest online learning is more fun, flexible, more economical, more time-saving, concise, practical, and can be done remotely without gathering in the same place [15,16]. The role of information (the internet) is very important in the learning process [17]. Now, the use of information technology is very broad, including e-learning, google classroom, WhatsApp, zoom meetings, and other information media that can connect teachers and students so that the learning process runs well [18]. But apart from some of these advantages, the teacher must prepare methods or learning media that are sufficient enough so that learning objectives can still be achieved, especially to improve aspects of knowledge, attitudes, and skills [19]. The selection and use of instructional media under the situation of the COVID-19 pandemic need to be adjusted to the students' condition so that learning can run efficiently and effectively.

The application of learning in Indonesia is not quite enough to encourage the students' critical thinking skills. The real conditions indicate there is a tendency for learning activities in the classroom, students still memorize the concepts or materials that the teacher provides. Therefore, teachers should train students to think critically in solving a problem with the aim that students can experience the development of high-level thinking skills [20]. Physics learning activities are inseparable from the national education objectives from human resources with good character. Physics learning can be done by integrating the values of physics with local culture because physics is a science that comes from and can be applied in daily life. Learning local wisdom can be done by integrating the values of local wisdom in the surrounding area into learning physics [21]. Therefore, learning physics can aim to integrate with aspects of local wisdom. The formation of student character can be done by integrating learning resources, one of which is the environment either natural or social environment based on where students live, which includes local wisdom [22]. Implementation of local wisdom in learning has a role in shaping a character or personality that is consistent with the noble values of the culture.

The information search type learning model is a learning model that encourages students to find information from various sources independently, both individually and in groups. This learning model encourages student activity so that the material taught can be accepted by students and learning objectives can be achieved. Group learning students will become more active [23]. The learning that is done in groups can improve students' critical thinking skills [24]. Active physics learning can change the one-way learning atmosphere into tutorial activities between friends so that it can achieve learning objectives, i.e. developing students 'critical thinking skills and students' character. In addition to being able to enhance the activeness and ability of students' critical thinking, research conducted revealed that group learning can increase the value of character, especially responsibility [25].

Based on the results of surveys and interviews with several senior high school physics teachers in physics learning activities during COVID-19 pandemic situations, most teachers have not used
learning media that is effective enough to empower student competencies, in this case namely critical thinking skills and student character values. Therefore it is necessary to analyze learning media needs, in this case, electronic learning modules (e-modules) that can be used to empower students’ critical thinking skills and character values in online learning during the COVID-19 pandemic.

Other research shows the use of e-modules can empower students' critical thinking skills and motivation [26]. But with this research, it can first analyze the media needed by the teacher to empower not only students' critical thinking skills but also students' character values in distance learning during the COVID-19 pandemic.

The purpose of this study was to determine and analyze the needs of instructional media in the form of electronic modules based on local wisdom to be able to measure students' critical thinking skills and character values so that it can be known and there is a follow-up from researchers on teachers in conducting online learning during the COVID-19 pandemic.

2. Research Methods
The research design used is descriptive research that illustrates the analysis of learning media needs in the form of e-modules to teachers during online learning with qualitative data types. This type of research is included in the descriptive research group.

A qualitative approach means collecting data, not in the form of numbers, but data from interview texts, field notes, personal documents, and other official documents. Qualitative methods as a research procedure that produces descriptive data in the form of written and oral words from people and observable behavior [27].

Descriptive research does not aim to test certain hypotheses, but only describes what it is about a variable or situation [28]. One of the categories included in descriptive research is survey research. This study aims to determine the needs and responses of teachers regarding the learning media used in the form of electronic modules based on local wisdom with the information search type to empower students' critical thinking skills and character values in online learning amid the COVID-19 pandemic. The flowchart of this research can be observed in Figure 1.
The focus of research is on teacher responses regarding the development of a physics e-module based on local wisdom type information search for learning media that can empower students during the Covid-19 pandemic. The subjects of this study were high school physics teachers in Surakarta and its surroundings (Soloraya).

The participants were chosen by quota sampling method. The quota sampling method is a non-random sampling technique in which participants are selected based on specific characteristics that have been determined by the researcher so that the number of samples will match with the distribution of characteristics of the larger population [29]. The participants of this research were 20 teachers from different regencies in Soloraya, such as Surakarta, Boyolali, Karanganyar, Wonogiri, Sragen, and Klaten. The specific subject characteristic is teachers who have teaching experience before and after the COVID-19 pandemic so that the teacher can fill out a questionnaire according to their teaching experience and the data that will be obtained is data that is following reality. After distributing the questionnaire, the next stage is the semi-structured interview process with the teachers.

Data collection was carried out using a questionnaire. A questionnaire is an efficient data collection technique, if the researcher knows definitely which variables to be measured, and knows what can be expected from respondents [28]. The instrument was designed with 15 question items consisting of 4 aspects: 1) Implementation of learning activities during the COVID-19 pandemic (online/offline), 2) Use of learning media during the COVID-19 pandemic, 3) The need for developing learning media in the form of e-modules to empower critical thinking skills and student character values in learning.
activities during the pandemic situation, and 4) Readiness of teachers to implement e-modules in physics learning during the Covid-19 pandemic. The answer to each item of the instrument used has positive and negative answers through two choices (yes or no). The answer to this question has described the four aspects, which will be analyzed according to the choice of most teachers in each aspect. The questionnaire distribution is done through Google form. Data collection was carried out during the COVID-19 pandemic, which was on July 20-July 24, 2020. Due to the health protocol of COVID-19 which requires humans to carry out physical distancing [30], the questionnaire was given to teachers by researchers via the google form link. The interview technique is needed to get more information about how the teacher responds to applying the electronic module.

3. Results and Discussion

The analysis results of the needs of e-modules based on local wisdom to empower students’ critical thinking skills and character values through network learning during the COVID-19 pandemic were distributed using questionnaires through the Google form. There are 20 high school physics teachers in Surakarta and surrounding areas involved in filling out this questionnaire.

| Teacher           | School                                      |
|-------------------|---------------------------------------------|
| Physics Teacher 1 | Senior High School in Sragen                |
| Physics Teacher 2 | Senior High School in Surakarta             |
| Physics Teacher 3 | Senior High School in Surakarta             |
| Physics Teacher 4 | Senior High School in Boyolali              |
| Physics Teacher 5 | Senior High School in Boyolali              |
| Physics Teacher 6 | Senior High School in Andong                |
| Physics Teacher 7 | Senior High School in Boyolali              |
| Physics Teacher 8 | Senior High School in Teras                 |
| Physics Teacher 9 | Senior High School in Surakarta             |
| Physics Teacher 10| Senior High School in Nogosari              |
| Physics Teacher 11| Senior High School in Surakarta             |
| Physics Teacher 12| Senior High School in Surakarta             |
| Physics Teacher 13| Senior High School in Surakarta             |
| Physics Teacher 14| Senior High School in Surakarta             |
| Physics Teacher 15| Senior High School in Surakarta             |
| Physics Teacher 16| Senior High School in Surakarta             |
| Physics Teacher 17| Senior High School in Klaten                |
| Physics Teacher 18| Senior High School in Klaten                |
| Physics Teacher 19| Senior High School in Wonogiri              |
| Physics Teacher 20| Senior High School in Karanganyar           |

The results of the questionnaire in the form of questions containing the four indicators can be presented in Figure 2.
Based on Figure 1, aspect 1, it is shown 95% of teachers carrying out online physics learning activities during the COVID-19 pandemic. This is because there are rules from the local government that encourage no direct learning activities. Aspect 2: 85% of teachers use additional media during online learning. This is supported by the results of interviews with the teacher, that majority of the teachers use and develop their learning media by using Google classroom, WhatsApp group, Microsoft team 36, and videoconferencing. Aspect 3: 95% of the teachers need local wisdom-based e-modules to empower students' critical thinking skills and character values through online learning during the COVID-19 pandemic. Based on the interview about Aspect 3, the teachers need media in the form of an e-module that can measure/assess students' critical thinking skills and character values, because in online physics learning there are no media that cannot assess these 2 indicators. Aspect 4, which is 95% of the teachers interested and willing to implement e-modules based on local wisdom type information search for physics learning activities in a COVID-19 pandemic situation.

Based on research results obtained from several informants (teachers) shows learning activities specifically Physics learning during the COVID-19 pandemic were carried out online. In online learning, there are some problems both in the aspect of material delivery and the aspect of measuring students’ outcomes. That is because there are no adequate learning media that is owned by the teacher in learning activities. Most teachers also need learning media that can measure the students’ ability to think critically and measure the students’ character values during the pandemic.

From interviews with informants, it shows that online learning, especially physics, is considered less conducive. According to some informants, the lack of a conducive atmosphere was explained by several factors. Besides the factors from the teacher in presenting the material, there are factors namely the network that is sometimes interrupted so that the learning process is not carried out smoothly. Furthermore, the learning situation using online methods based on information from informants shows that the online learning situation is not as effective as the conventional learning process in the classroom as usual. This is proved by teachers who obtain information from students who find it difficult to understand the material/lessons and show their misunderstanding in a question to each teacher.

From these factors, the informants need an electronic learning module or e-module based on local wisdom with the type of information search in online learning during the COVID-19 pandemic that can empower students' critical thinking skills and character values. Most of the teachers (informants) are willing to implement the learning media.

Based on research on some articles the resulting data is that students' critical thinking skills are very influential on student activities, in this case by online learning such as discussions [31]. The use
of the active learning model of the information search type that focuses on students in groups can solve problems to improve students’ critical thinking skills. And in the research [32], concluded that students who learn using local wisdom-oriented media are superior to students who learn without using Balinese local wisdom oriented comics in learning motivation and understanding concepts. This study illustrates that local wisdom can be integrated with a subject and has a positive influence on learning. The results and advantages obtained in this study were the development of an e-module for physics learning that was integrated into local wisdom with the information search type which could be used by teachers to empower students’ critical thinking skills and character values in online learning amid the covid pandemic 19. The government is implementing a policy of closing school institutions to reduce the spread of Severe Acute Respiratory Syndrome coronavirus which has a distance in a change in learning from face-to-face to learning. And the media in the form of electronic modules is one of the solutions for distance learning.

4. Conclusion
Based on the explanation of the results and discussion, it can be concluded that the Senior High Schools’ Physics Learning in the Surakarta City and surrounding areas during the COVID-19 pandemic mostly used online learning with the help of media used from the teachers themselves. However, to measure students’ critical thinking skills and character values, teachers do not yet have a certain medium to measure them. Therefore, a learning media development in the form of electronic modules (e-modules) based on local wisdom type information search is needed to empower students’ critical thinking skills and character values in learning activities during the situation of COVID-19 pandemic.

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