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Motlan, Jurubahasa Sinuraya and Satria Mihardi

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Motlan[a)], Jurubahasa Sinuraya[b)] and Satria Mihardi[c)]

Department of Physics, Universitas Negeri Medan, Jl. Willem Iskandar Psr V Medan Estate, Medan 20211, North Sumatera, Indonesia

[a)] *Corresponding author: motlan@unimed.ac.id*
[b)]*jurubahasa@unimed.ac.id*
[c)]*mihardi@unimed.ac.id*

Abstract. This research aims to describe: (1) high school physics teacher perception on blended learning, (2) physics teacher skill in using technologies in teaching, and (3) the availability of teaching devices that support blended learning. This research uses a survey method. The subject of this research consists of 72 high school physics teachers of 33 districts/municipalities which are at North Sumatera. The instruments used are questionnaires, interview forms, and documentation study. The data analysis technique uses descriptive by percentage. This research shows that: (1) high school physics teacher perception in using blended learning is positive consecutively: 9.0 % strongly agree, 50.0% agree, 30.0% quite agree, and 11.0% don't agree; (2) high school physics teacher in using teaching technology tends to be good with the details are as follows: 74.0% capable of using online and blended learning, 79.0% can access teaching video, and 73.0% can conduct video editing; and (3) the availability of learning devices covers lesson plan, teaching materials, student worksheet, media, the strategy of developing teaching devices, and evaluation instruments, is 85.0%. However, the relevancy aspect in supporting blended learning of overall learning device is 60.5 %.

INTRODUCTION

The availability of the learning devices used by physics teachers at the high school level of the North Sumatra already have 3 aspects (knowledge, skills; and attitudes), but have not been internalized well in its implementation and are limited to aspects of knowledge. In addition, the average value of the National Exam based Computer Department of Natural Sciences based on the data of the Ministry of Education and Culture Education Assessment Center for the field of physics studies in North Sumatra is very low (41.47) [1-2]. The development of learning devices designed should have directed education towards the development of more creative and innovative student ability. Another problem that is currently happening is the impact of Covid 19 which its impact on the worldwide learning system including learning in Indonesia, namely changes in the face-off learning system to be online learning, resulting in significance of learning devices, and the technology used in learning.

In the learning process and learning devices based on cyber technology such as using various multimedia-based multimedia and e-learning, so students have digital literacy skills (new media literacy) and literacy Information and Communication Technologies (ICT) [3-5]. For this reason, e-learning-based learning design is needed. The development of the Learning Devices of Scientific-based physics and blended learning needs to be done due to the lack of basic learning devices in high schools that internalize the K-13 revised 2016. System Learning Devices will make it easier for teachers to develop effective learning that have an impact on improving the quality of physics learning outcomes at levels Senior High School. Learning Devices Adjustment of Blended Learning Indicators is expected to improve the quality of graduates to be more competitive and effective [6-8].

Development in the education system by implementing the Blended Learning Management Systems (BLMS) which is a way taken based on the demands of learning in the era of the Industrial Revolution 4.0. The utilization of this management system is able to make the education system more attractive, innovative and futuristic in line with

technological development [9-10]. Effectiveness of Implementation of Blended Learning Management Systems (BLMS) is achieved if supported by relevant learning devices such as the Lesson plans, Students Books, Media, Students Worksheets, and learning strategies that are in accordance with the characteristics of BMLS. The initial steps that must be carried out in developing effective and relevant learning devices with the essence of Blended Learning is to conduct a need analysis [11-15]. Aspects needed in analysis of these needs include: Physics teacher's responses to Blended Learning physics learning, the picture of the ability of teachers using technology in learning, and learning devices available at schools that are already relevant to the concept of learning blended learning. Data Analysis of this need is used as a reference for innovation to which parts of each learning devices to produce relevant development products for use in Blended Learning Management Systems (BLMS).

METHODS

The method used is a survey. The subjects involved were high school physics teachers amounted to 72 people from 33 districts in the North Sumatra. Data collection instruments are a questionnaire and made in the form of google form to be filled by respondents, the format of interviews used through the use of mobile phones, and documentation studies related to the sample learning devices obtained via email. Data analysis techniques used descriptive analysis method with percentage techniques criteria [16-18].

TABLE 1. Percentage Criteria

Percentage interval	Criteria
$81.25\% \leq P \leq 100\%$	Very Good
$62.50\% \leq P < 81.25\%$	Good
$43.75\% \leq P < 62.50\%$	Sufficient
$25.00\% \leq P < 43.75\%$	Poor

RESULT AND DISCUSSION

The results related to the analysis of the needs of learning devices to support the learning of high school physics based on Blended Learning in North Sumatra are shown in Figure 1.
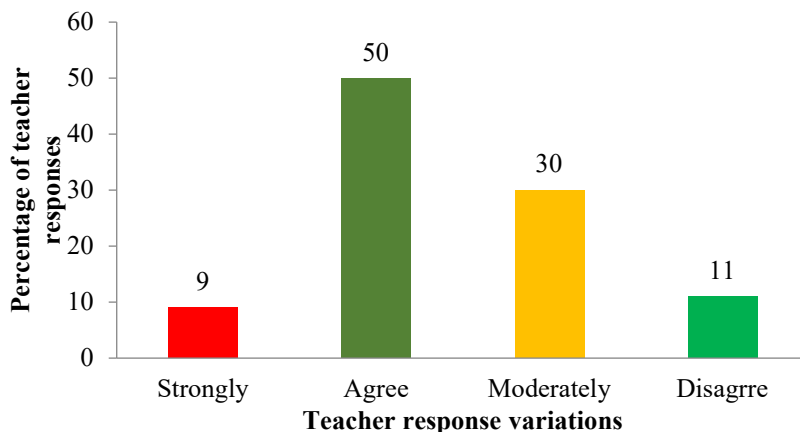

FIGURE 1. Diagram of high school physics teachers toward Blended Learning

Figure 1 shows that the learning needs of the Blended Learning-based learning in high school physics learning are very high, only 11% of all respondents who declare disagree. Through Blended Learning can improve the quality of online learning which has been carried out at all levels of education in Indonesia, including in the North Sumatra High School [9], [11-12], [15]. Teachers and students need a learning pattern that integrates technology in learning (Blended Learning) can create a learning pattern, which is effective and fun in accordance with the interest of

students [19-21]. Blended Learning can also be well implemented, the skills and experience of teachers carry out online learning (online), blended learning, access video, edit videos, and so on. The results of the need for analysis, some descriptions of the experience and skills of high school physics teachers are needed in learning blended learning as in Figure 2.
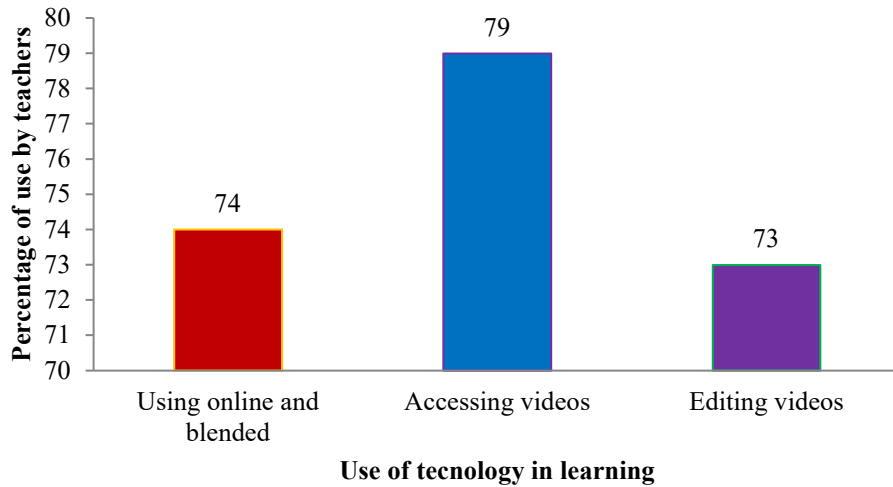

FIGURE 2. Diagram of teacher skills in the use of technology in teaching and learning

Figure 2 shows that the percentage level of high school physics teachers in North Sumatra Province using technology in managing physics learning is good. The management of online-based learning and blended learning is largely (74%) teachers have been implemented in high school and editing and the use of video media has been implemented [22], [23]. The use of videos in learning has a very good effect in improving student learning outcomes. Other research findings related to the learning requirements of Blended Learning are the availability of relevant learning devices and support the concept of learning blended learning. The research findings related to the Learning Devices oriented Blended Learning are shown in Figure 3.
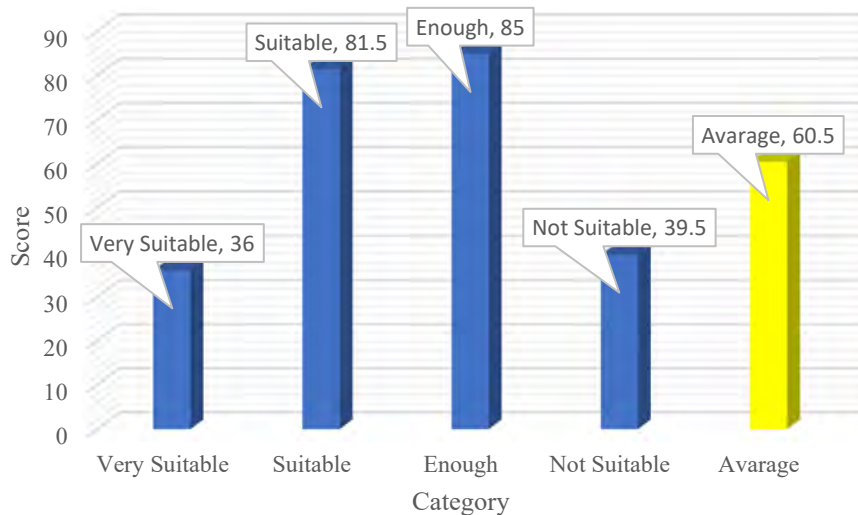

FIGURE 3. Relevancy Category of High School Physics Learning Device

Figure 3 shows from 72 respondences obtained data collection data with a category of 60.5% of devices considered to have fulfilled the connection with Blended learning system. The hardware of this device is based on the design of learning, media selection, and an evaluation system that is adjusted to the achievement of successful

academic skills-based learning. This adjustment is considered with the possibility of the relevance of blended activities [24]–[26]. In this achievement, there is still a need for an increase to achieve the compliance expected by developing learning devices to be more in line with the indicators of the development of Blended learning devices. Optimizing the use of media and evaluation systems need to be adjusted to support activities through assignments that can show indicators of successful academic skills. These claims are highly related to be applied in blended learning. With the existence of this conference, it can facilitate learning with a combined system [27]–[29]. These claims can not only make it easier but can also be a picture of better-blended learning and focus on the expected achievement. Accustomedness is based on lesson plans as relevance, Students books, Students Worksheet, media/strategies, assignments, and evaluation instruments.

CONCLUSION

The conclusion of this study shows that: (1) The perception of physics teachers using Blended Learning in North Sumatra High School tends to agree with the details: 9% strongly agree, 50% agree, 30% sufficiently agree, and 11% disagree; (2) Physics teacher skills using learning technology tends to be good with details: use of online and blended learning by teachers as much as 74%, accessing 79% learning video and editing 73% learning video; (3) the availability aspects of the device include Lesson Plans, Students books, Students Worksheet, media/strategies, assignments, and evaluation instruments are available (85%), but from the relevant aspects of the contents with the overall blended still in the medium category (60.50%).

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