

## IMPLEMENTATION OF E-LEARNING AS A MEDIA FOR BIOLOGY LEARNING BY HIGH SCHOOL TEACHERS IN BIREUEN DISTRICT

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### ABSTRACT

The advantages of developing and implementing information technology in education include increased learning effectiveness and flexibility, as well as making the learning process easier for teachers and students. The study was conducted in the even semester of the 2018/2019 academic year in Bireuen Regency to determine the use of e-learning as a medium for high school biology learning. Mix methods research was used in this study. The participants in this study were all Bireuen Regency public high school teachers. The participants in this study were 12 biology teachers from SMAN 1 Bireuen, SMAN 2 Bireuen, and SMAN 2 Peusangan. A questionnaire is used to collect information. The data were analyzed using the percentage formula. The results showed that the use of e-learning as a medium for biology learning by teachers at SMA Bireuen Regency in terms of several criteria, namely e-learning planning was 77.08% and e-learning implementation was 72.50%. So it can be concluded that the use of e-learning as a medium for learning biology by teachers in senior high schools in Bireuen Regency as a whole is effective.

**Keywords:** E-learning, biology learning, media learning, high school teachers, media implementation

### INTRODUCTION

The development of own, creating its own world. information technology necessitates the development of an IT-based teaching and learning concept and mechanism. Technology, on the other hand, cannot advance without a solid scientific foundation.

Science and technology become inseparable because they mutually support one another. Technology is a branch of science that evolves on its effectiveness and flexibility of The benefits of developing and implementing information technology in education can increase the

learning, making it easier for teachers and students in the learning process. E-learning is a type of information technology that is used in the field of education, particularly science. Distance learning can be accomplished using it, specifically by utilizing electronic media in the delivery of learning in the form of the internet, CD, or by using a cellphone [1].

E-learning is an educational innovation that involves the conversion of the learning process in schools or universities into a digital format that is linked by internet technology. E-learning enables the delivery of teaching materials to students via the internet or other computer network media, whenever and wherever they have access to this system. Because of the availability of learning materials in electronic media and the enrichment of learning materials following progress and development of science and technology, the use of e-learning as a learning medium is very effective for improving the quality of learning, improving the learning process inside and outside the classroom, and changing the passive way of student learning to an active learning culture.

According to the findings of Cimer's (2012) study on the difficulties and ways to improve the effectiveness of Biology learning (as perceived by students), the majority of students suggested using visual media. Many abstract concepts and phenomena in biology necessitate observation, so students must see what they are learning. The use of e-learning-based learning media in the form of a website is one solution to support the visualization of learning materials, the imbalance between learning materials and time allocation, and a student-centered learning approach. The media can be used not only to clarify the material being taught but also as a learning resource that students can access [2].

Based on observations in Bireuen Regency, several schools already have hotspot area facilities, and the presence of adequate facilities is sufficient to facilitate internet access in schools; additionally, the availability of similar facilities outside of school supports the implementation of e-learning learning. Teachers' use of internet resources can help them reach their full potential. However, e-

learning-based learning media are still not widely used. Training on the use of the internet as a learning resource, learning media, and evaluation tool has been implemented to assist biology teachers in the learning process; however, there are still biology teachers who have not applied the results of the training because they consider e-learning based learning difficult to implement, despite the fact that the learning is more efficient to facilitate teachers and students themselves. As a result, the concept of e-learning becomes an alternative for teachers and students in developing themselves in accordance with learning objectives in order to have an effect on increasing students' abilities.

## **METHODS**

This study was carried out at a high school in Bireuen Regency during the Even Semester of the 2018/2019 Academic Year. The population in this study consisted of all-state high school teachers in Bireuen Regency, with the research sample consisting of 12 biology teachers from SMAN 1

In terms of value range:

Bireuen, SMAN 2 Bireuen, and SMAN 2 Peusangan. Purposive sampling was used, which meant that all of the schools that were observed had hotspot area facilities. A questionnaire with 25 statements was used to collect data. The percentage formula was used to analyze the data.

## **MATERIALS AND METHODS**

This study was carried out at a high school in Bireuen Regency during the Even Semester of the 2018/2019 Academic Year. The population in this study consisted of all-state high school teachers in Bireuen Regency, with the research sample consisting of 12 biology teachers from SMAN 1 Bireuen, SMAN 2 Bireuen, and SMAN 2 Peusangan. Purposive sampling was used, which meant that all of the schools that were observed had hotspot area facilities. A questionnaire with 25 statements was used to collect data. The percentage formula was used to analyze the data.

$$\text{Percentage} = \frac{\Sigma \text{Achieved score}}{\Sigma \text{Max score}} \times 100\%$$

Table 1. Action success rate score [3].

Score (%)	Qualification
81-100	Excellent
61-80	Good
41-60	Pretty good
21-40	Not good
0-20	Bad

### Results and Discussion

The use of E-learning as a media for biology learning by school teachers in Bireuen Regency is assessed using aspects of E-learning planning and implementation (Figure 1). The use of e-learning media by teachers is a type of assessment used by schools to determine professional competence. These are the efforts of the school to maximize the use of e-learning media. Teachers benefit greatly from the availability of e-learning media because it encourages students' active participation in finding and retrieving information or learning materials, thereby training students' independence in learning.

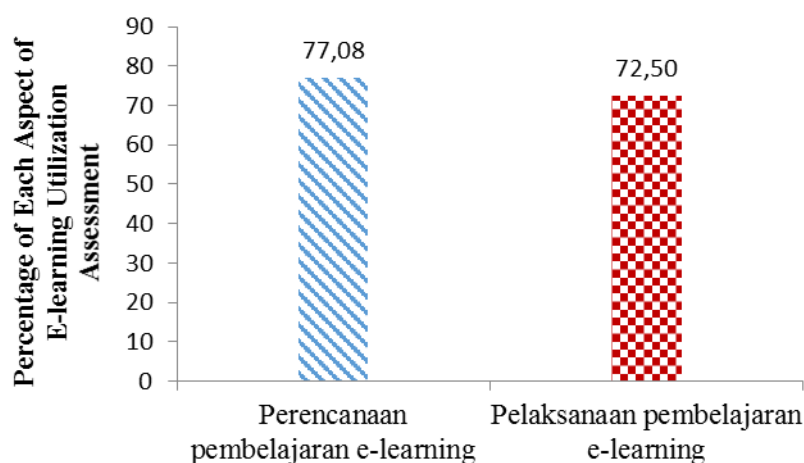


Figure 1. Bireuen District High School Teachers' Use of E-Learning as a Biology Learning Media.

#### 1. E-learning Planning

E-learning planning describes the actions that will be taken during the learning process. The scope of this planning includes the preparation of internet connected devices, e-learning planning tools, e-learning features, designing and creating teaching materials, delivering learning media, evaluating learning, and internet networks that support e-learning implementation.

Table 2. displays the results of the teachers' opinion questionnaire about e-learning planning. Adequate

facilities and infrastructure are required for the use of e-learning media. This is supported by the completeness of school facilities and infrastructure, as well as by the biology teachers themselves. E-learning is the process of learning through the use of electronic devices, particularly computer devices [4]. According to the findings of this study, all of the schools studied in Bireuen had infocus, adequate computer facilities both in the laboratory and owned by teachers to support e-learning learning.

Table 1. Teacher's Opinion Questionnaire on E-learning Planning

No	Statement	Teacher's Answer Percentage	Keterangan
1.	Facilities and infrastructure in schools support the use of e-learning learning media.	75 %	Good
2.	You or the school will continue to make efforts to provide e-learning facilities and media to support learning activities.	79,17%	Good
3.	The school is attempting to increase teacher competency to maximize the use of e-learning.	77,08%	Good

Schools in Bireuen that became part of the research sample have worked hard to finish the facilities needed to support ongoing e-learning activities. Every school has adequate hotspot and wifi networks. Teachers must be competent in order to take

advantage of existing information technology, as well as have the skills and creativity to develop better and more interesting learning. This ability is critical for maximizing the use of information technology infrastructure provided by schools and the

government so that visible facilities and infrastructure are no longer abandoned only as room decorations and to complement the school's identity [5].

In addition to facilities and infrastructure, schools continue to strive to develop teachers' competence in order to maximize the use of e-learning, such as by facilitating teachers' participation in e-learning-related training and workshops. According to Rijki (2018), e-learning media is used because it is flexible, not time-limited, and will facilitate learning for both students and teachers. These efforts are aimed at promoting effective learning. Then there is the school's planning of teaching devices in this case the teacher has been treated by the school which aims to adjust the teaching devices with e-learning learning media. Teachers have attended training on the development of e-

module applications, Moodle, and the P4TK-recommended "Ruang guru" [6].

Based on the study's findings, it was discovered that SMA in Bireuen Regency had planned to use e-learning as a learning medium by biology teachers, as evidenced by the school's facilities that already support the use of e-learning. E-learning in biology subjects is planned using an e-module application that includes several supporting applications in the learning process, including the homepage, syllabus page, materials, competency tests, and learning videos.

## 2. Implementation of E-learning

According to the study's findings, students at SMA 1 Bireuen, SMA 2 Bireuen, and SMA 2 Peusangan had a good understanding of e-learning. **Table 3** depicts the teacher opinion questionnaire on the implementation of e-learning.

Table 3. Teacher Opinion Questionnaire on E-Learning Implementation

No	Statement	Teacher's Answer Percentage	Annotation
1.	E-learning media is frequently used by teachers in the biology learning process.	75%	Good
2.	E-learning media can be applied to all biology learning materials.	75%	Good
3.	Every biology teacher at your school uses e-learning differently.	66,67%	Good
4.	Have you ever used e-learning as a tool for	66,67%	Good

No	Statement	Teacher's Answer Percentage	Annotation
5.	evaluating learning? Have you ever created your e-learning platform?	79,17%	Good

The application of e-learning in schools requires the school to understand e-learning. The use of technology in the learning process gave birth to a new concept based on IT known as e-learning, which has a variety of learning media from which teachers can choose [7][10]. As a result, teachers must be able to apply information and communication technology, such as e-learning, in an integrated, systematic, and effective manner based on the situation and conditions, including the ability to use technology as a learning resource and learning media. The advancement of science and technology is increasingly encouraging reform efforts in the use of technological results in the learning process [8].

Teachers at SMA Bireuen Regency have used e-learning media to help students learn biology. According to our findings in interviews, the material that frequently uses the media is abstract biological material such as organ systems from the respiratory system,

digestive system, nervous system, reproductive system, excretory system, and metabolic material, which is one of the materials considered important by teachers to use instructional media. Almost all biology materials in the Bireuen learning process have used e-learning media, both online and offline. Such as learning videos that the teacher has previously designed or downloaded to reduce the allocation of learning time. Similarly, teachers can make use of PowerPoint media to transfer materials that require visualization. Because some biological materials cannot be observed directly, for example, to observe microscopic sizes due to a lack of tools or a practicum, visualization learning media can represent the material to be conveyed.

Students engage in e-learning not only by listening to material from educators, but also by actively observing, performing, and demonstrating. Teaching materials can be visualized in a variety of

formats to make them more interesting and capable of motivating students to study more thoroughly. According to Solihudin (2018), computer technology can visualize materials that are difficult to present, particularly abstract phenomena [9].

We discovered that biology teachers in Bireuen generally use the same e-learning media that was designed, developed, and implemented collaboratively by all biology teachers. E-learning is used as a learning medium as well as a learning evaluation tool. The availability of computer facilities and infrastructure, which are normally reserved for the national exam (UNBK), is also used for the evaluation process, as demonstrated by the SMAN 2 Peusangan teacher. This makes it easier for teachers to provide feedback and review test results.

Teachers benefit from the use of e-learning; it's just that some teachers lack the creativity to design

e-learning in such a way that they don't use it. Biology learning media such as LCD, projector, computer, TV, and Biology teaching aids are widely available in SMA 1 Bireuen, SMA 2 Bireuen, and SMA 2 Peusangan. The teacher maximizes the availability of learning media for teaching and learning activities. The use of media not only adds to the interesting delivery of material but also helps students understand the Biology material being studied.

## CONCLUSION

The use of e-learning as a medium for learning biology by teachers in senior high schools in Bireuen Regency is overall good, with 77.08 % e-learning planning and 72.50 % e-learning implementation.

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