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Content Analysis and Implementation of Biology Online Learning Materials in SMA/MA/SMK During the Covid-19 Pandemic

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Abstract

This article aims to explain the content and implementation of online biology learning materials during the COVID-19 pandemic in SMA / MA / SMK. Face-to-face learning that is transformed into online learning has a profound impact on the content and amount of material taught by teachers to students. Even with the implementation of the emergency curriculum which reduces some basic competencies in one subject, there are still materials that are not conveyed by the teacher for several reasons. This is due to the selection of essential materials, allocation of time, facilities and media, as well as student learning fatigue using online platforms. This article is the result of observations, document studies, and library research. The schools selected in observing the implementation of the learning materials were SMAN 16 Padang, MAN 2 Padang, and SMK Kesehatan Gema Nusantara Padang. This is due to the selection of essential materials, the allocation of time, facilities and media, as well as student learning fatigue using online platforms. Content analysis and implementation were carried out on the learning material which took place from July-October 2020. The analysis of this research was taken from a qualitative approach, and the results were described in a descriptive-analytical manner. The results showed that some of the material subtopics contained in the curriculum and contained in the lesson plan were not delivered by the teacher 25% to 40% in ineffective online learning.

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INTRODUCTION

The school curriculum is a process content, both formal and informal, intended for students to gain knowledge and understanding, develop skills and change appreciation of attitudes and values with the help of schools (Mudlofir, 2012). From these definitions, the curriculum can be interpreted in three contexts, namely as a number of subjects that must be taken by students, as a learning experience, and as a learning program plan.

So the curriculum is an educational program that contains various teaching materials and learning experiences that are programmed, planned and systemically designed on the basis of applicable norms which serve as guidelines in the learning process for education personnel and students to achieve educational goals (Dakir, 2014).

The content of the curriculum is basically materials or materials that are arranged to be given to students in order to achieve the stated goals. Content or material as material for learning activities for students, with regard to scientific knowledge and other forms of learning experiences that are compiled by taking into account the level of conformity with various aspects, such as types and levels of education, level of development and needs of children, development and demands of society, and development of science and technology.

Disease due to *Corona Virus* or SARS-CoV-2, hereinafter referred to as COVID 19, has been declared a global pandemic by the *World Health Organization* (WHO) since the end of February 2020. In Indonesia alone the first case of COVID 19 was confirmed in early March 2020 and with quickly spread throughout the province exist so that the government establishes a national emergency response. With stipulation Therefore, Indonesia has activated and improved the emergency response mechanism as a form of prevention (Widyaningrum, 2020).

After determining and being aware of the COVID-19 pandemic, it also has an impact on the implementation of education in Indonesia. Teaching and learning activities that are always carried out face to face or in person, are converted into several online learning systems, so that learning activities can continue. Online learning is a learning system that is done not face to face, but using a platform that can help the teaching and learning process that is carried out even though it is a long distance. The purpose of online learning is to provide services quality learning in a network that is massive and open to reach more and wider study space enthusiasts (Sofyana & Abdul, 2019). The development of information technology has a major influence on changes in every field. One of them is changes in the field of education. Technology can be used in teaching and learning activities, which can be said to be a change from conventional to modern.

However, the implementation of online learning is still ineffective, especially in terms of content / learning material which is an important part of a curriculum as we discussed earlier. Biology learning which has a lot of essential materials and needs to be known by students cannot be transferred optimally because of various inhibiting factors in learning online. Based on interviews and observations with teachers about online biology learning conducted at SMAN 16 Padang, it was found that online learning was not very effective, especially regarding the content of the material implementation. This still happens even though learning has implemented the COVID-19 emergency curriculum where several topics in learning are reduced in the syllabus and lesson plans prepared by the teacher. For example, in class X biology learning, there are several learning materials that are removed such as protozoa, bacteria, and material about fungi. Inhibiting factors in online learning and time constraints have an impact on the content and implementation of learning material, so that each material in the sub-section that has been written in the syllabus is not maximally presented by the teacher at SMAN 16 Padang. The same incident was alo found in biology learning carried out at Madrasah Aliyah (MA) as was observed in MAN 2 Padang. The phenomenon is also different in the implementation of biology learning in SMK. From the results of interviews with biology teachers at SMK Kesehatan Gema Nusantara Padang who made biology one of the subjects of the adaptive group, it was found that the implementation of learning materials was not optimal even though the number of biology lesson hours in SMK was less than in SMA / MA.

Based on the problems found, the author will explain in more detail by analyzing the implementation of online biology learning materials at SMA / MA / SMK to find out the pattern of its application and the factors that affect the implementation of the material in learning as a problem in the online learning process.

RESEARCH METHOD

This article is the result of observations, document studies, and literature reviews (*library research*). The school chosen in observing the implementation of the learning material is SMAN 16 Padang, MAN 2 Padang, and SMK Kesehatan Gema Nusantara Padang. Data obtained by conducting interviews with class X teachers, conducting document studies learning tools used, and literature study on the learning theory related to the problem. Load and implementation analysis were carried out on learning material which lasted from July-October 2020. The analysis of this research was taken from a qualitative approach, and the results are described *descriptively-analytically*

RESULTS AND DISCUSSION

Content and Implementation of Learning Materials

The results of the study were obtained from teacher documentation and interviews on the implementation of biology learning materials conducted online in class X semester 1 of 2020 at SMA / MA / SMK. This article limits and explains the content intended is curriculum content tailored for online biology subjects and the intended implementation is the material conveyed by the teacher's explanation during the learning process outside the teacher providing teaching materials and students are asked to study independently. The content of the material implementation in each school has a different picture. For the content of learning materials, there is a reduction or streamlining of the previous material content, where there are some learning materials that are not included in the learning planning prepared by the teacher. This is based on a circular from the ministry of education and culture regarding the COVID-19 emergency curriculum. The description of the findings in each school can be seen in the following table:

Table 1 Online Biology Learning Material Planning based on RPP at SMAN 16 Padang

No	Basic Competencies	Material
1	Describe the scope biology (problem on various biological objects and level of life organization), through the application of the scientific method and the principles of work safety	Scope of biology
		Branches of biology
		Benefits of biological sciences
		Scientific method
		Work safety
2	Analyze multiple levels biodiversity in Indonesia.	Biodiversity level
		Biodiversity benefits
		Indonesian biodiversity
		Causes damage to diversity

Table 2 Implementation of online Biology Learning Materials in Class X SMAN 16 Padang

No	Basic Competencies	Materials	Implemented	No
1	Describe the scope biology (problem on various biological objects and level of life organization), through the application of the scientific method and the principles of work safety	Scope of biology	√	
		Branches of biology	√	
		Benefits of biological sciences		√
		Scientific method	√	
		Work safety		√
2	Analyze multiple levels biodiversity in Indonesia.	Biodiversity level	√	
		Biodiversity benefits		√
		Indonesian biodiversity	√	
		Causes damage to diversity		√

Table 3 Planning of Online Biology Learning Materials based on RPP in MAN 2 Padang

No	Basic Competencies	Material
1	Describe the scope biology (problem on various biological objects and level of life organization), through the application of the scientific method and the principles of work safety	Scope of biology
		Branches of biology
		Benefits of biological sciences
		Scientific method
		Work safety
2	Analyze multiple levels biodiversity in Indonesia.	Biodiversity level
		Biodiversity benefits
		Indonesian biodiversity
		Causes damage to diversity

Table 4 Implementation of online Biology Learning Materials in Class X MAN 2 Padang

No	Basic Competencies	Materials	Terlaksana	Tidak
1	Describe the scope biology (problem on various biological objects and level of life organization), through the application of the scientific method and the principles of work safety	Scope of biology	√	
		Branches of biology	√	
		Benefits of biological sciences	√	
		Scientific method	√	
		Work safety		√
2	Analyze multiple levels biodiversity in Indonesia.	Biodiversity level	√	
		Biodiversity benefits	√	
		Indonesian biodiversity	√	
		Causes damage to diversity		√

The table above shows the content and implementation of learning materials carried out online. The content and implementation of material in SMA and MA are more or less the same, where several subtopics on basic competencies are not conveyed by the teacher. The number of subtopics that were not conveyed in online biology learning at SMAN 16 reached 40% (4 subtopics) of the total subtopics, and the material not conveyed in MAN 2 Padang reached 25% (2 subtopics). The results of the material implementation analysis at SMAN 16 Padang showed that there were 4 subtopics that were not conveyed and explained by the teacher during online learning. These subtopics include benefits regarding biological sciences, safety in laboratories, benefits of biodiversity, and causes of damage to biodiversity. Meanwhile, in biology lessons at MAN 2 Padang, there are 2 subtopics that are left behind, including safety in laboratories and damage to biodiversity. In summary, the implementation of the material in schools which is the object of research can be seen in the following diagram:

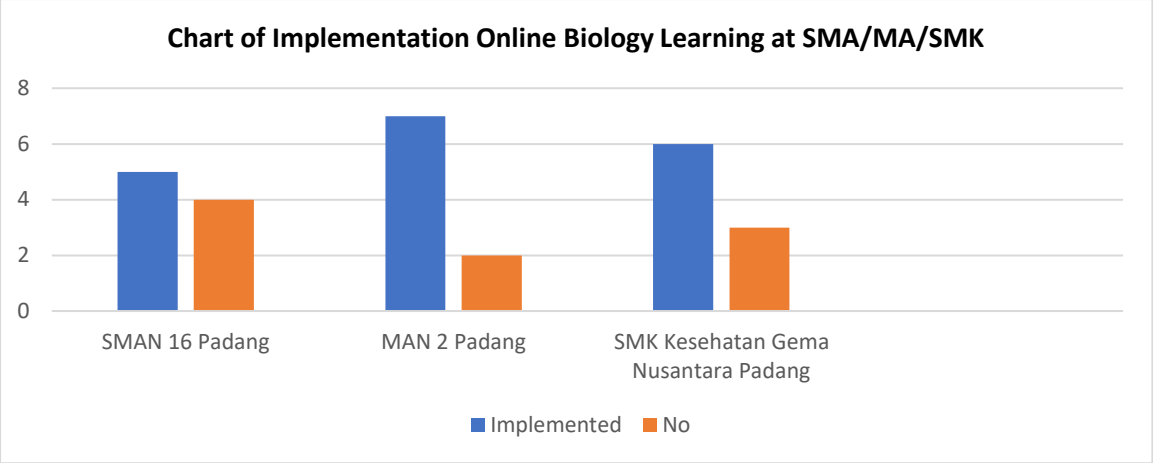

Figure 1 Chart of Implementation Online Biology Learning at SMA/MA/SMK

If seen, conditions like this indicate learning is less effective than face-to-face learning during normal conditions before the pandemic. However, the material still has to be conveyed to students. The material received actually depends on the student's learning style. Learning style is one of the most important parameters in determining individual differences (Özyurt & Özyurt, 2015). In determining the selection of material that must be delivered by the teacher, several considerations must be needed so that the maximum effort is made. The criteria include validity, level of importance, meaning, worthy of study, and attracting interest. Valid; it can be interpreted that the material given in biology learning must have been tested for its validity and validity. In order not to be outdated, in this connection also that matter must fulfill the element of actuality. Level of importance; It is interpreted that the content given really feels the importance of learning, especially by students in order to equip the ability (competence) to be actualized in real life every day. Meaningfulness, namely that the material studied by students has a broad meaning including for the benefit of academic and non-academic abilities. Worth learning, meaning that seen from the level of difficulty, the material has a high feasibility as material for students to learn. Attracting interest; namely that the material must attract interest, so that students are motivated to study it individually, in groups, and classically (Sukirman & Anugrah, 2018).

In addition, the learning planning used by teachers at SMAN 16 Padang and MAN 2 Padang has used the COVID-19 emergency curriculum, where some of the materials in the 2013 revision were removed, resulting in a simplification of the curriculum. However, the implementation is still not optimal, and the material implementation is still decreasing.

Different things are obtained from learning biology at SMK. Biology learning in SMK is different from SMA / MA where the curriculum content and time allocation also experience differences. Biology subjects are in the position of the adaptive subject group as much as 2 lesson hours. The analysis of the implementation of online biology learning materials at SMK Kesehatan Gema Nusantara Padang is as follows:

Table 5 Online Biology Learning Material Planning based on RPP at SMK Kesehatan Gema Nusantara Padang

No	Kompetensi Dasar	Materials
1	Analyzing various levels of biodiversity	The concept of biodiversity
		Biodiversity benefits
		Threats to diversity
		Diversity in Indonesia
		Efforts to conserve biodiversity
2	Classification of organism	Purpose and benefits of classification
		The process and results of the classification

		Nomenclature
		Identification of organism

Table 6 Implementation of Biology Learning Materials in Class X SMK Kesehatan Gema Nusantara Padang

No	Basic Competencies	Materials	Implemented	No
1	Analyzing various levels of biodiversity	The concept of biodiversity	√	
		Biodiversity benefits	√	
		Threats to diversity	√	
		Diversity in Indonesia		√
		Efforts to conserve biodiversity		√
2	Classification of organism	Purpose and benefits of classification	√	
		The process and results of the classification	√	
		Nomenclature	√	
		Identification of organism		√

From the results of the analysis above, it can be seen that online biology learning at the SMK level is still not effective even though the time allocation given is less than in SMA / MA. Learning biology at SMK Kesehatan echo Nusantara Padang still shows that there is material that is not conveyed and implemented by the teacher during online learning. The number of subtopics not delivered by the teacher reached 40% (3 subtopics).

Furthermore, we can compare the analysis of the implementation of this material between SMA / MA with 4 JP time allocation and SMK with 2 JP time allocation. In learning conducted in SMA / MA, the amount of material not conveyed by teachers tends to be more than in SMK. This can be returned to the curriculum content which requires more materials in SMA than SMK even though the emergency curriculum has been implemented.

Influencing factors

This article attempts to explain what factors influence compliance biology learning material in SMA / MA / SMK. Learning that is changing from face-to-face to online learning creates panic for teachers (Harris, McCarthy, Wright, Schutz, & Boersma, K. S., Shepherd, 2020). Online learning has a wider impact (Ilgaz & Adanır, 2020). The author assumes the teacher has run according to online learning procedures and using supporting media and facilities to teach. He did not convey all the biology learning materials during Online learning is actually influenced by several factors that determine its effectiveness online learning or not. As with the data obtained at SMAN 16 Padang, MAN 2 Padang and SMK Kesehatan Gema Nusantara Padang, teachers focus on deliver core materials in one basic competency, due to time constraints, limited media for learning, infrastructure, and online student learning saturation.

The material presented during online learning is essential material. Theory essential is material in the form of core concepts that are very important to convey in learning. The Minister of Education and Culture (Mendikbud) instructed so that the learning process is carried out from home through Circular Number 4 of 2020 regarding the Implementation of Education Policies in an Emergency for the Spread of Covid-19. This policy was taken as an option so that learning continues even with various adjustments in the midst of the health crisis due to Covid-19. In this circular, the ministry gives confidence to teachers to make adjustments to curriculum materials to ensure the learning process continues. "Simplification or streamlining this curriculum so that teachers can focus on more essential (material), not (pursuing) the completeness of the curriculum, because it is more important to deepen the concept fundamental (Kemendikbud RI, 2020).

Next that affects the learning material so that it can be conveyed during online learning is time allocation. Time allocation is the duration of the activity learning carried out in a classroom or laboratory that is limited by conditions Tight time allocation is usually done by comparing several implementations different programs in the same amount of time. Programs that can achieve goals the most in the predetermined time can be categorized as the most programs efficient (Mulyasa, 2010). In online biology learning, the actual allocation used tends to be less because of the limited use of media and infrastructure online learning, such as the availability of gadgets for students, internet packages, signal strength, and cost

of education online. So that teachers are more likely to use that time allocation little and resulting in content and learning materials not conveyed in a manner maximum.

Furthermore, the availability of media and learning facilities is also a factor determine the implementation of the material in biology learning. Media and means learning used in online learning greatly affects the content and the implementation of the material in learning. Media and learning facilities used by SMAN 16 Padang, MAN 2 Padang, and SMK Kesehatan Gema Nusantara Padang virtual meeting platforms like zoom and google meet. This application is used only for Virtual meetings are short and sometimes time-limited due to teachers using free account (Mori, 2020). But online learning also has its challenges. One of them is the availability of the internet network. Some claim to be difficult to follow online learning because not all regions have an internet network with smooth access (Hasanah, 2020). This makes them difficult when they will collect assignments. Apart from the challenges regarding internet service, another challenge is cost constraints. To take part in online learning, students must pay a fee more to buy internet quota. Especially when learning is done via video conference will use up internet quota very much. Based on information from Din (in CNN Indonesia, 2020) published on May 25, 2020 mentions that the data consumption for video conferencing uses a zoom application with quality 720P video for one hour consumes 540 MB of data (Din, 2020).

Boredom learning also results in decreased concentration and absorption of students subject matter given. Because saturation is the location of the dead end of feelings and the brain due to continuous learning pressure. Students or university students tend to be cynical and apathy towards the lesson by showing a lack of confidence and attitude avoid it and do not understand the lessons that have been received (Arirahmanto, 2018). As for learning fatigue, it can be grouped into three groups, namely: sense exhaustion, fatigue physical, and mental fatigue (Muna, 2013). Sensual and physical fatigue can be relieved byadequate rest, but if mental fatigue is not easy to overcome. Therefore, Mental fatigue is a major factor that causes boredom in learning (Ardiani, 2020).

Impact on Learning Outcomes

Online learning is a way of changing learning systems and strategies during this pandemic, moving from face-to-face learning. The obstacles in online learning are the internet network and the implementation of practicum learning during COVID-19 (Yustina, Halim, & Mahadi, 2020). However, the goals of education must not fail by changing the learning system. The lack of the amount of material presented will have an impact on the quality of learning and the mastery of the material by students as the main goal of enhancing science, especially biology (İpek, Atik, Tan, & Erkoç, 2020). The data obtained above still shows that the amount of material delivered is not in accordance with the planning made by the teacher, even though it has used the COVID-19 emergency curriculum with some reduction in material or basic competencies. Likewise, with the allocation of learning time.

The existence of the material or content of the curriculum subsystem has a very decisive function and role for students to have through a quality learning experience. Material can be likened to staple food which will determine the level of human quality in every type and level of education. When the staple food served meets the specified criteria, it will produce something good for human growth and development.

Therefore, the amount of material explained by the teacher to students will determine the form of learning experience that students will accept (Pakpahan, Hernawati, & Ardiansyah, 2020). With an insufficient and incomplete amount of material, it will have a negative impact on learning outcomes.

On the other hand, if the teacher provides solutions for material that is not conveyed to students by providing teaching materials or books, it will stimulate students' metacognitive abilities. Metacognition is a person's awareness, belief and knowledge about the process and how to think on things they do themselves so improve the learning process and memory (Chairani, 2016).

CONCLUSION

Based on the results of the content analysis and implementation of online biology learning materials at SMAN 16 Padang, MAN 2 Padang, and SMK Kesehatan Gema Nusantara Padang, it can be concluded that the material is not conveyed optimally by the teacher with a percentage of up to 50%. This is very different from the planning that was originally prepared by the teacher, there has even been a reduction in material according to the implementation of emergency kuriukul. The problem of not delivering this learning material is influenced by several factors that are predicted to have a direct impact on learning outcomes, including the selection of essential materials, time allocation, media and facilities, and learning burnout.

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