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NEEDS ANALYSIS ON THE DEVELOPMENT OF INTEGRATED GITTW HYBRID LEARNING MODEL IN THE LEARNING OF BIOLOGY AT SENIOR HIGH SCHOOL

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ABSTRACT

The rapid development of technology in the era of globalization affects the world of education. As a result, learning must be able to adapt by utilizing technology. in line with this, there are problems in learning biology such as the lack of understanding a biological concepts, learning motivation and learning independence of students. As the consequency, the learning outcomes is declining. This study aims to determine the needs and potentials of teachers and students in learning biology as the basis for developing an Integrated GITTW (Group Investigation and Think Talk Write) Hybrid Learning Model strategy in Biology learning. This research is a descriptive type with the research subjects of teachers and students of grade X science at Senior High School in the city of Surabaya. Data were collected through observation, documentation, questionnaires and interviews. The results of the study reveal that teachers and students need the learning innovations by utilizing learning technology. The integration of technology in learning makes it easier for students to obtain information from various media and learning resources. The hybrid learning model integrated with the GITTW strategy with Moodle-based media makes learning more effective, efficient, and interesting and according to students' interests in using media such as smartphones and laptops. Through the model that will be developed, learning problems in comprehending biological concepts, learning activities and motivations as well as students' learning independence that are lacking in biology learning are expected to be resolved. Based on this fact, it is necessary to develop a hybrid learning model that integrates the GITTW strategy in biology learning.

Key Words: biology learning, GITTW strategy, hybrid learning

Introduction

Blended learning and hybrid learning are methods that can be used as alternative in Indonesia to face the digital era. Hybrid Learning is a learning model that combines conventional learning (face to face) with ICT-based learning. Hybrid learning describes an environment where conventional face-to-face classes are supported by offline or online activities carried out through computer technology (Anthonysamy, L, Koo, A & Hew, S. 2020). Hybrid learning is an innovative learning model that combines technology and information-based learning with face-to-face learning (learning in class). In blended learning, besides combining online and offline learning, it also combines methods, media, learning strategies and the environment (Graham et al., 2013). In this model, learning does not focus on face-to-face activities in the

classroom but also uses web-based technology (online learning).

In hybrid learning, students can search for material in various ways, such as having discussion with friends, doing library activities (during face-to-face). During online, students can access materials by opening websites, e-books, or by using learning media in the form of learning information systems (e-learning). A number of studies on hybrid learning show a positive effect on learning outcomes (Rafiola et al, 2020), more effective than traditional learning (Uz, Ruchan & Uzun, 2018), effective in improving critical thinking and communication skills (Hasanah & Malik, 2020), hybrid learning can cover all fields of knowledge so as to facilitate students and teachers in the learning process, students become more active in student-centered learning (Putra, 2015).

Biology learning emphasizes on providing students with direct experience to gain a deep understanding of themselves and the natural surroundings. Biology as one of the fields of science provides a variety of learning experiences to understand the concepts and processes of science. This requires process skills which include observing, proposing hypotheses, using tools and materials properly and correctly by considering work safety and security, asking questions, classifying and interpreting data, as well as communicating findings orally or in writing, digging and sorting relevant and factual information to test ideas or solve everyday problems.

The problem during the Covid-19 pandemic is that learning has been mostly done online (full online). Students tend to be less motivated to prepare themselves to carry out the learning. In this activity students only expect the teacher's help in solving problems and there is no motivation to find out. Students are more focused on the teacher's instructions and are not able to relate learning to their previous knowledge. In addition, in learning biology, students are expected to be able to train themselves to be skilled at observing, analyzing, processing information, synthesizing to solve problems and communicating the results.

To overcome these problems, we need a learning strategy that is considered appropriate to be applied to biology learning, namely the GITTW (Group Investigation and Think Talk Write) strategy. GITTW provides opportunities for students to be actively involved in learning

(thinking, sharing and writing), practicing reasoning skills, analyzing, solving problems through investigation, creating students to become independent learners. The GITTW strategy has the potential to empower students in learning. Research results reveal that the GITTW strategy is able to empower metacognitive skills, creative thinking skills and biological cognitive learning outcomes (Listiana, et al., 2016).

The activity of understanding the concept of Biology subject matter can be done in self-asynchronous learning. By the freedom to explore learning resources in cyberspace, it is also hoped that students' motivation and interest will emerge to read and understand the material without depending on the teacher. Students access various learning resources from anywhere by relying on an internet connection, including material provided by the teacher, for example in the classroom. Students carry out the thinking process by enriching the references obtained freely and easily. In the presentation session of the findings, there was interaction among students. The teacher acts as a facilitator and evaluates the understanding of the learning materials, which can be done synchronously.

The GITTW's integrated hybrid learning model is expected to provide solutions to problems in Biology learning. The interest of students in understanding the material and activities in learning is expected to increase. Based on this, researchers are motivated to carry out a needs analysis as a basis for carrying out research on the Development of the GITTW Integrated Hybrid Learning Model in Biology Learning at Senior High School in Surabaya.

Methods

This is descriptive research. The research was conducted at high school in the city of Surabaya. The research subjects were biology teachers and grade X Science students at Muhammadiyah high schools in the city of Surabaya in the odd semester. The subject was chosen because X science class is the first year student in senior high school and must be sure of mixed learning in the post-pandemic period. It was taken in academic year of 2021-2022 with a sample of 12 biology teachers and students from 7 Senior High schools taken from one school each class, the total sample size is 155 students. Data were collected through direct

interviews with students to find out the learning difficulties experienced during the learning process in Biology subjects. Interviews were conducted to determine the responses, interests and experiences of students in using interactive learning media such as laptops and smartphones. It also to find out the teacher's needs for online learning models as well as problems that often arise during learning activities. The data collected is qualitative which will then be analyzed descriptively with the triangulation method and data sources.

Results and Discussion

User needs in this case schools and biology teachers for the development of the GITTW integrated hybrid learning model in biology learning are based on the results of initial observations, analysis of student conditions, survey results and interviews with biology teachers in each school in Surabaya and adapted to the results of content analysis in biological material.

The results of observations and interviews with students about students' learning difficulties are used as material for designing learning. The findings show that during the online learning pandemic, students face the problem in understanding concepts and processes in biology lessons, making it difficult to relate these concepts to other mechanisms. Online learning time is also very limited and as the result, causes teachers to always give assignments every day.

Analysis of student needs using questionnaires and interviews aims to determine student responses and interest in learning media used such as laptops and smartphones. The result of the questionnaire shows that 69.17% of students enjoyed to use laptops or smartphones. However, as many as 63.16% of students stated that there were obstacles in carrying out online learning. As many as 97.74% of students have learned to use other media such as videos, pictures, and others, and 87.97% of students stated that learning biology using media was intersting since it can show how things work from pictures and videos. As many as 75.94% of students claimed that they were happy and interesting to use the internet as a learning resource in learning biology.

The result of the survey through questionnaires and teacher interviews reveals that (1) during the pandemic period, most schools held online learning and only a small part used hybrid learning; (2) Constraints experienced during online learning such as lack of learning motivation, feeling bored, low quality of rapport,

students tend to be passive, students' understanding tends to be lower, teachers have difficulty completing material and doing laboratory practice, and problems with internet connection and package; (3) students are less motivated and spiritless in learning, obstacles in internet packages, lack of understanding of the material, some of them feel enthusiastic, ease but getting bored. (4) Students' interest in using laptop and smartphone media for learning: they are very enthusiastic, very interested, and really like it. (5) Facilities used by teachers for online learning are smartphones and laptops, school e-learning, videos, youtube, zoom, WA class groups. (6) Learning applications used by school are school e-learning, zoom, google meet, WA, youtube, quizizz. (7) Schools have some applications such as learning moodle or e-learning. (8) The difficulty of students in understanding the material is because there are many abstract concepts that require high reasoning: almost all students have problems in understanding the material and concepts. (9) Can teachers apply learning strategies to develop higher thinking skills in digital-based learning: 60% of teachers said they can. The rest of them said they can't and a bit difficult. (10) Online learning models needed to achieve the learning objectives should be creative, innovative, discovery learning, direct practicum learning, learning with direct interaction and given worksheets, looking for information through the internet, videos and pictures.

Content analysis is carried out by reviewing the syllabus for biology subjects, competency standards and basic competencies, then developed into lesson plans, worksheets and assessment tools to implement hybrid learning. The analysis of the content of biology learning for class X IPA is as shown in table 1 below.

Table 1. Core Competence and basic Competence in Biology Class grade X Science of SMA

Core Competence 3 (knowledge)	**Core Competence 4 (Skills)**
3. Understanding, applying, analyzing factual, conceptual, procedural knowledge based on their curiosity about science, technology, art, culture, and humanities with insight into humanity, nationality, state,	4. Processing, reasoning, and presenting independently on the concrete and abstract areas related to the development of what they learn in school and being able to use

and civilization related to the causes of phenomena and events, as well as apply procedural knowledge in the specific field of study according to their talents and interests to solve problems	methods according to scientific rules
Basic Competence	Basic Competence
3.1 Explain the scope of biology (problems on various biological objects and levels of life organization) through the application of scientific methods and safety principles	4.1 Present data from the application of scientific methods on problems in various biological objects and levels of life organization
3.2 Analyze various levels of biodiversity in Indonesia and their threats and conservation	4.2 Present the result of observations on various levels of biodiversity in Indonesia and proposed conservation efforts
3.3 Explain the principles of classifying living things in five kingdoms	4.3 Compile a cladogram based on the principles of classification of living things
3.4 Analyze the structure, replication and role of viruses in life	4.4 Conduct campaigns about the dangers of viruses in life, especially the dangers of AIDS based on their virulence levels
3.5 Identify the structure, way of life, reproduction and the role of bacteria in life	4.5 Present data about the characteristics and role of bacteria in life
3.6 Classify protists based on general characteristics of the class and relate their role in life	4.6 Present an investigative report on the various roles of protists in life

Spiritual attitude competence is "comprehending and practicing the teachings of the religion adhered to". Social Competence, namely "Demonstrating honest, disciplined, responsible, caring behavior (mutual cooperation, cooperation, tolerance, peace), polite, responsive, and pro-active as part of the solution to various problems in interacting effectively with the social and

natural environment and placing oneself as a reflection of the nation in the world society". These two competencies are achieved through indirect teaching, namely good moral exemplification, habituation, and school culture by taking into account the characteristics of the subjects as well as the needs and conditions of students. The growth and development of attitude competence is carried out throughout the learning process and can be used as a teacher's consideration in developing the character of students further.

Based on the results of initial observations, questionnaires and interviews, information was obtained that learning during this pandemic and furthermore effective learning innovations are needed, namely learning to use various media and learning resources to achieve learning objectives. Learning media plays an important role in the learning process and a teaching tool for teachers in delivering subject matter and increasing students' attention during the learning process. Media as learning resources can be used by students independently, information related to teaching materials can be widely accessed to complete their assignments. According to Nursamsu & Kusnafizal (2017), proper and good use of media facilitates teachers in delivering material effectively and efficiently. This attracts students' interest and attention so that their understanding of the material becomes better. In line with research that has been done that the use of learning media has a significant effect in increasing student motivation (Ristawati, 2017), improving student learning outcomes (Fayanto et al., 2019) and increasing student understanding and interest (Nuroifah, 2015).

The use of smartphones and laptops in learning makes students very enthusiastic. Biology learning becomes interesting and fun using media such as pictures, videos, and the internet as learning resources even though there are obstacles such as limited internet package. Seeing the enthusiasm and interest of students, a learning information system or mobile-based learning application can be made to present complete material with examples, in the form of pictures, videos, and animations to help students in understanding an abstract concepts. According to Halidi et

al. (2015), ICT-based learning media is a very helpful tool for teachers in delivering information to students which is packaged in such a way from abstract to concrete to make the learning process more enjoyable. Digital learning provides opportunities for more student engagement, flexibility and convenience in learning because students can learn with technology at any time. In line with this the opinion, Ang et al. (2018, pp. 87-101); Jurkovic (2019) say that digital learning gives students the opportunity to learn anywhere, anytime; Yang (2020) no limitations of space and time. Research by Lin, Chen, and Liu (2017) reveals that digital learning has a more positive effect on students' learning motivation and learning achievement than conventional learning. Sackey et al., (2015) state that digital learning encourages students' interest so that they will be more motivated to learn in a technology-based environment and (Mishra, 2020) can improve student academic achievement.

Hybrid learning or blended learning is a technology-based learning model by utilizing technological developments. Hybrid learning describes learning in traditional classrooms and online learning to create flexible student-centered learning (SCL) (Tang & Chaw, 2016). Hybrid learning is partly digital learning where conventional face-to-face classes are supported by offline or online activities carried out through computer technology (Anthonysamy, Ah-Choo, and Soon-Hin, 2019). According to Chaeruman (2011), blended learning is a futuristic learning strategy that facilitates more effective, efficient, and interesting learning for students. The weaknesses of online learning can be overcome by the strength of face-to-face learning and vice versa, the weaknesses of face-to-face learning can be overcome by the strengths of online learning. Learning with this hybrid learning model encourages students to learn independently, students can determine for themselves the material to be studied and manage when and how to access the information needed to solve problems. This is reinforced by the result of research by Uz & Uzun, (2018) which reports that the use of blended instruction is more effective than conventional learning in developing self-

regulated and self-directed learning.

One of Web-based learning media (online) uses technology that involves a Virtual Learning Environment (VLE) is a Moodle. Moodle stands for Modular Object Oriented Dynamic Learning Environment. Moodle is an application program that can convert a learning media into a web form. This application allows users to enter into a virtual "classroom" to access learning materials. By using Moodle, you can create learning materials, quizzes, electronic journals and others like a class (Rizal & Walidain, 2019). Moodle has a complete system with many features that make it more effective for use as a learning tool. Through this model, teachers can upload material in the form of text, web, animation, video, e-book and activities such as presentations, discussions, exams and online learning (Micro, 2011).

Based on the content analysis of class X Biology material, it shows that the material is widely discussed about concepts related to the processes that occur in the environment and in the body of living things which are interrelated between systems in an ecosystem and the biosphere with various complex problems. In some Basic Competencies (KD) the depth of content can be observed. This is needed to formulate the learning objectives to be achieved. In order to achieve the goal, the process to understand the concepts, mechanisms and problems in the material is not only enough to get an explanation from the teacher but can be visualized through the media for example in the form of videos, pictures. Research by Nomleni & Manu (2018) say that the use of videos and teaching aids as learning media can improve understanding on the concept and problem solving.

Biology learning examines various natural events with complex phenomena requires a complete understanding in order to solve related problems. Therefore, students must actively seek their own information through various sources to be able to find solutions to problems. In addition, students must be able to observe, identify, analyze, and conclude their findings. These learning activities require a stimulus or stimulus so that students are motivated. In addition, the couragement from teachers by drilling and

habituation in digital learning is also needed. Through the use of learning strategies used by teachers, it is an alternative learning to improve learning activities, students' understanding and ability to solve problems, and is supported by media and sources that train students to become independent learners.

Based on the problems described, an effective learning innovation is expected to improve understanding of concepts, learning activities and problem solving skills, namely the GITTW (Group Investigation and Think Talk Write) learning strategy. This strategy is considered appropriate to be applied in learning biology and science at school or in college. It makes students actively seek information, analyze and find solutions to problems. It can maximize students' potential in learning. Several studies reveal the potential of the GITTW strategy, such as improves students' cognitive abilities, empowers metacognitive skills (Listiana et.al., 2016), empowers creative thinking skills (Listiana & Arsad, 2019), and increases self-regulation (Listiana et al., 2020). The implementation of this strategy is able to increase student learning activities through their independence in managing learning and learning methods so as to improve other abilities in learning. Students will be trained to be independent and sucessful learners.

The hybrid learning model is appropriate to be applied in the current digital and technological era by integrating the GITTW strategy in hybrid learning to overcome the problems of learning biology. Of course, this has an impact on increasing comprehension of the concept of biology subjects and increasing student activities and other abilities. The need for the development of a hybrid learning model integrated with the GITTW strategy to make students independent learners in their learning process and to help teachers make it easier to carry out learning in order to achieve the set learning objectives. As a solution, an integrated hybrid learning model based on Moodle based GITTW with the development of learning tools, namely lesson plans, worksheets, and evaluation instruments is appropriate to solve the problem of media and learning resources is needed be to develop.

Conclusion

Based on the results of the research that has been done, it can be concluded that an effective biology learning model is needed to utilize technology in learning so that students can easily find information from various sources and media. Utilization of this technology with a mixed learning model, namely a hybrid learning model that integrates the GITTW strategy with Moodle-based media. This model makes learning more effective, efficient, and interesting and meet with students' interests in the utilization of media such as smartphones and laptops. Through the model that will be developed, learning problems in comprehending biological concepts, lack of activity and learning motivation and learning independence of students who are less trained in biology learning are expected to be resolved. Therefore, it is necessary to develop an integrated hybrid learning model with the GITTW (Group Investigation and Think Talk Write) strategy in biology learning.

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