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Integrating Simas eric with google classroom: enhancing biology students' motivation and scientific writing

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A B S T R A C T

This research aims to improve the motivation and student scientific writing skill (SCWS) by applying the integration of Simas eric and Blended learning models. This study was a classroom action research method conducted in one of the classes in the biology education program for the National student scientific week (PIMNAS) project, Universitas Tidar. The results of the study were analyzed descriptively. The results showed an increase in students' motivation and learning outcomes in scientific writing. Students' learning motivation was increased on average by 10,59% and SCWS by 33,28%. The results of this study can be used as an alternative reference for lecturers or educators as an effort to improve student learning motivation so that the scientific writing obtained can be increased. To conclude, the integration of Simas eric with google classroom can enhance students' motivation and SCWS in biology students.

INTRODUCTION

Many attempts to improve the quality of education have been carried out in Indonesia. This effort can be seen from the growing development of the curriculum used to improve the previous one (curriculum 2013 became 2013 revised). This curriculum change was influenced by the changes in the educational paradigm apply globally (Rukmini & Saputri, 2017; Djamahar, Ristanto, Sartono, Ichsan, & Muhlisin, 2018). Some of the paradigm changes that can be suspected are; the paradigm of science as products turns into science as a process, learning as an instructive activity becomes learning

as a facilitative activity, and conceptual assessment changes into authentic assessment (Rahadian, 2016; Lestari, Mertha, & Kusmiyati, 2019). On each process of developing innovative learning products, embed in our mind that students, teachers, and all interactions are always changing. This is explained in a learning and teaching, motivation, and the role of feedback theories. However, no single approach is comprehensive enough or perfectly cover the learning process (Taras, 2010; Djamahar, et al., 2018; Ristanto, Zubaidah, Amin, & Rohman, 2018a).

The changing paradigm of Biology learning at the university also emphasizes the students' science process skills (Auerbach & Schussler, 2017; Lestari, Ristanto, & Miarsyah, 2019). Lecturers should not only transfer their knowledge to students but rather act as facilitators. Hopefully, the science process skills can be possessed by students. The effort can be started from the process of designing learning activities. As stated by Kistner, Rakoczy, Otto, Klieme, & Buttner (2015) planning in learning aims to ensure that everything done by a teacher can provide a good environment or atmosphere that supports students to learn. Judging by its underlying theory and the conducted empirical studies, the flipped classroom model appears to address several challenges with traditional ways of lecturing and pave the way for active learning strategies and the use of classroom time. Engaging them into higher levels of Bloom's taxonomy such as application, analysis, and synthesis (Nouri, 2016).

The low quality of education in Indonesia is caused by many factors (Anggraini et al., 2018; Utomo et al., 2018; Ismirawati, Corebima, Zubaidah & Syamsuri, 2018; Wahono & Chang, 2019). One possible factor in terms of lecturers is that lecturers are less creative in planning and implementing learning activities at universities. During this time, the learning still uses conventional methods. Conventional methods are identical to traditional knowledge which makes lecturers as the center of learning activities (Glaze, 2018, Mahanal, et al., 2019). Although many innovative learning methods have been developed and proven to increase students' motivation and learning outcomes in scientific writing (Arahmat, Suratno & Wahono, 2017), in fact, lecturers are reluctant to implement them for fear of not able to complete the material burden that must be taught.

Universitas Tidar is one of the State Universities in Central Java. Universitas Tidar organizes the Department of Biology Education which is a new at the Teacher Training and Education Faculty (FKIP). Biology Education Study Program also prints prospective Biology educators, so that students who are taking teacher education at the University are expected to become professional teachers. As a new study program at Universitas Tidar, students tend not to be motivated in learning. This causes the learning outcomes in scientific writing to be less optimal, more specifically in the course of scientific writing. Thus, it is necessary to conduct class action research in the course

Students in teaching and learning activities need internal motivation to get optimal learning outcomes in scientific writing to support their goal of becoming professional teachers. Nevertheless, over the past 30 years, educational university and traditional lectures, in particular, have been sharply criticized. The main critics has cast light on the following: students are passive in regular lectures due to the lack of mechanisms that ensure intellectual engagement with the material, students' attention wanes quickly, the pace of the lectures is not adapted to all learners needs, and traditional lectures are not suited for teaching higher order skills such as application and analysis (Nouri, 2016; Azrai, Evriyani, & Prastya, 2016).

Student learning motivation is an important variable that influences the success of achieving learning objectives (Supriyatin, Miarsyah, & Melia, 2017; Azrai, Evriyani, & Prastya, 2016). This is consistent with Darmawan et al,. (2017) & Ernawati et al., (2017) learning with motivation will be better than learning without it. The low motivation will result in the low understanding of students about the concepts of Biology. Learning motivation is an intrinsic driving factor that becomes a driving force for someone to learn and keep learning. As stated by Hodges (2004), students who are motivated to learn will have higher achievements than they who do not have it, and students who can learn well will be more motivated to carry out learning activities on the next occasion. In line with that, Asvio, Arpinus, and Suharmon (2017) show that achievement motivation has a contribution to learning achievement. Several things can indicated students' learning motivation. Some of them as

stated by Ristanto, Zubaidah, Amin, & Rohman (2018b) is the existence of hopes or ideals, the desire to succeed, and the need for learning. Sardiman (2009) & Ristanto (2011) adds different things such as diligent or resilient in facing the task, and interest in solving various problems. Referring to the data, the lecturers must be creative in determining the learning method that can increase students' learning motivation so that learning outcomes in scientific writing will be achieved.

Based on observations on scientific writing learning activities on Biology Education, Universitas Tidar, information showed that student activity and involvement in the learning process were low. Students only passively heard lecturers' explanations and lacked of enthusiasm in participating the lesson. The action of students in asking questions was very low even though lecturers often allowed students to ask questions. In discussion activities, only sure students paid attention and participated actively in the discussion while most of them only listened, and some even spoke themselves. Students found difficulty to master, associate and apply the theory of scientific writing.

Besides the observation, the questionnaire rubric was filled by students. From the results of the rubric, information obtained that the main obstacle faced by lecturers was students who mostly had relatively low learning motivation. Also, students have not been able to associate the concepts learned to real scientific writing so that meaningful learning has not been achieved. The low activity of students in learning activities can be caused by low motivation in students. The problem of low activity generated by the low motivation of students can be caused by the learning method used and the time of teaching and learning activities consumed which was spent in a long duration. Especially in such time which was the ideal time to get rest (13.00-14.40 PM).

Many factors support the success or the failure of learning. These factors include learning media used, methods used by lecturers, lecturers' ability to manage classes, student motivation, student participation, student potential, and interaction between students and lecturers in the learning process. The study investigated the possibility of blended learning in a Ugandan University and examined whether student characteristics, such as self-regulation, attitudes towards blended learning, computer competence, and student background, such as family support, social support, and management of workload, were significant factors in learner outcomes, such as motivation, satisfaction, knowledge construction and performance (Kintu et al., 2017). Student activity in learning is one of the essential elements in determining the effectiveness of learning. The effectiveness of learning will occur if students are actively involved in a learning process and organizing the discovery of information (knowledge). While cognitive engagement includes motivational aspects, much of the literature focuses on how students use active learning and higher-order thinking, in some form, to achieve content mastery. For example, there is a significant emphasis on the importance of deep learning, which involves analyzing new education in relation to previous knowledge, compared to surface learning, which is limited to memorization, recall, and rehearsal (Schindler et al., 2017). As the opinion of Dunlosky et al., (2013), active learning can be achieved if the lecturer gives time for students to investigate themselves, observe themselves, study on their own, and look for solutions themselves. To increase the success of the learning process, the lecturer must look for alternative learning which can encourage students to participate in experiencing the learning process actively.

One of the constructivism-based cooperative learning models is the Simas eric method, learning model developed by Darmawan et al., (2015, 2016 & 2017). The syntax of Simas eric learning models consists of *skimming, mind mapping, questioning, exploring, writing, and communicating* (Darmawan et al., 2015). The activities of lecturers and students in this learning model are as follows: (1) **Skimming**: lecturers give assignments to students to read the material at home. Students conduct a quick review of an article with a focus on titles, introduction, images, tables, graphs, summaries, and conclusions, (2) **Mind mapping**: lecturers facilitate students to be able to make proper and correct mind maps and ask students to create it as their homework. Students make a mind map, based on the results of skimming. Students make it on a piece of paper which is an authentic work in the stage of skimming and mind mapping, (3) **Questioning**: lecturers divide students into heterogeneous groups and ask them to make high-level questions with keywords why and how. Students independently make questions and then discuss in groups getting the appropriate

questions, (4) **Exploring**: lecturers provide opportunities for students to re-read, experiment if needed and talk with group friends to find solutions. Students re-read the material more carefully to get a solution to the question, (5) **Writing**: the lecturer asks students to write answers in the sheet prepared by them. Students write answers to the questions that they have made by reviewing and discussing in advance with the group, (6) **Communicating**: lecturers provide opportunities for students to present class and discuss classically. Students perform and discuss classically the questions that arise in the questioning stage.

To support the Simas eric learning model, Blended learning is also used. Blended learning is learning that combines several forms of instruction to achieve learning goals by connecting offline classes with online classes (Okaz, 2015; Dziuban, et al., 2018). Blended learning can make students to be more active in participating learning activities. It is stated that Blended learning is effective, fun, supportive, dynamic learning and motivates students to learn. (Guzer & Caner, 2014; Bonk & Graham, 2006; Zainuddin & Keumala, 2018).

In this learning activity, researchers used a *Google Classroom-based learning* platform designed to provide services to students with a robust, secure and integrated online system to create a personalized learning environment. The grading system was also integrated into it, so students can directly access the scores obtained. The combination of SIMAS ERIC and Blended learning models is a new learning model for increasing students' motivation and learning outcomes in scientific writing. From the description mentioned above, the researcher intends to research enhancing student motivation and learning outcomes in scientific writing through integration of simas eric and blended learning.

METHOD

Design of the Study

This research was a classroom action research conducted in lectures on scientific writing in the Biology Education Study Program, Universitas Tidar. It was conducted in 2 learning cycles. Each cycle consisted of four stages, namely, planning, action, observation, and reflection. Each period was carried out in 2 meetings, with the duration of each session for 2x50 minutes (2 credits). The first cycle was on 20th September and 27th September 2018, the second cycle was held on 4th October and 11th October 2018.

Procedure

The planning stage is a first activity consisting of lecture design activities that are based on the findings of problems faced by students while participating in the scientific writing lecture. For more details, see Figure 1.

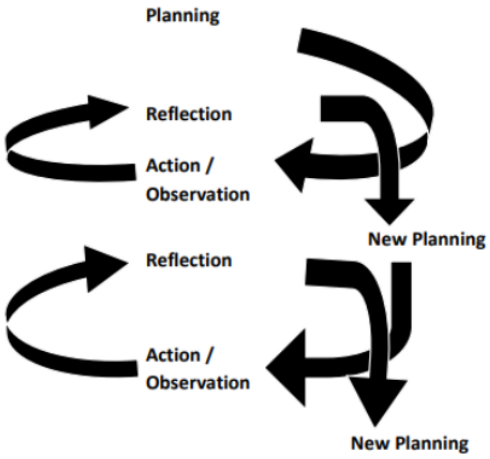

Figure 1. Spiral Classroom Action Research (Hopkins, 1993)

The planning phase produced a *Lecture Implementation Plan* (RPP) and prepared the need of all the learning tools. The implementation phase of the action was the stage of implementing RPP in the scientific writing lecture activities. At this stage the Simas eric model integrated with blended learning was used.

The observation stage was the activity of collecting students' data in the form of motivation and student learning outcomes in scientific writing. Reflection stage was the evaluation stage of lecture activities that has been carried out based on motivation and learning outcomes in scientific writing. Data obtained acted as input to design lecture activities in the next cycle.

Participant

This research conducted in the odd semester in September - October of the academic year 2018/2019. The subjects of this study were students from the 3rd study group with 29 students.

Instrument

This study used two instruments, namely, a tool to measure student learning motivation and a device to measure student learning outcomes in scientific writing. Student learning motivation instrument used a closed questionnaire of 5-point Likert-type scale, that was, very appropriate, appropriate, doubtful, inappropriate, and very incompatible. The ability test to write scientific writing projections for PIMNAS was performed to access the students' learning outcomes. Other supporting instruments such as documentation photos and journals of learning activities were applied as well.

Data Analysis

Data from the results of this study were analyzed qualitatively to see the changes in the level of motivation and student learning outcomes in the scientific writing lectures. Data analysis was used to determine the success of the actions that had been implemented. Research is said to be successful if the data of learning motivation can be done by comparing the motivation score of the cycle I and cycle II. The results of the analysis are presented in the form of tables and graphs in the result and discussion section.

RESULT AND DISCUSSION

Increasing Students' Learning Motivation through Integration of the Simas eric Model with Google classroom

Motivation to learn in this study consisted of five indicators, namely, desire to succeed, learning needs, have a hope, interest in the problem, and tenacity of learning. Figure 1 shows a comparison of the average percentage of each indicator of student learning motivation in one class in the first cycle and second cycle. Table 1 shows the increase in each learning gauge motivation from the learning cycle I to the learning cycle II.

In the second cycle, the indicator of student success shows a higher percentage than the first cycle. Substantial desire increase by 7,16%. This increase can be explained because the learning model applied uses a scoring system that can be directly accessed by students using Google Classroom as the application of Blended Learning. The scoring system allows students to know the score obtained from prior learning. A score is a form of appreciation as well as evaluation of a lecturer to students for the process of participating in learning activities. Awards and assessments given by lecturers can increase students' learning motivation, in this case, the students' strong desire was used as an indicator. This is in line with Keller (2008) & Ristanto (2011), some of the factors that can give rise to learning motivation are appreciation and evaluation.

Learning needs as an indicator of learning motivation can be increased by directly involving students in learning activities. This is explained by Agrawal & Singh (2011) that if *the need for included* can be fulfilled, it will generate energy for students to move forward trying to gain knowledge (with the learning process). There was a significant increase between the first cycle and

the second cycle on the needs of students in learning with a rise of 11,84%. It explains that *the demand for included* students increases in the learning process. Simas eric and blended learning have succeeded to improve student motivation. This increase can be explained by the syntax of the Simas eric model facilitating students to engage in the processing of independent learning material. Namely, (1) skimming which promotes students to read the subject matter of the study independently, (2) mind mapping facilitates students to create mind maps regardless from the results of the skimming process, and syntax (3) questioning which promotes students to make high-level questions.

According to Elsbach (2003), expectations reflect individual perceptions regarding their capacity to conceptualize goals, develop specific strategies to achieve the goals, initiate and maintain motivation to use the intended approach. More simply according to Higgins & Kruglanski (2007), hope is considered a positive mental state of the ability to achieve goals in the future. Hope has also been found to load on a conscientiousness factor. As with the intelligence variables, it is possible that hope only appears to lead to higher academic achievement due to more hopeful people also being more conscientious. Therefore, it is also essential to control for conscientiousness when examining the relationship between hope and academic achievement (Day & Hanson, 2010). Students who are motivated in learning can be seen by having positive self-expectations during the learning activities. The expectation is related to the ability to achieve the set learning goals. Other positive psychology constructs such as self-efficacy and optimism propose similar patterns of achievement motivation. The agency and pathways components of hope, however, differentiate concern from these other constructs. Each model relates differentially to the typical efficacy and outcome expectancies that are described in the motivational literature (Snyder, 2002). Increased learning motivation and student learning outcomes between cycle I and II can be seen at Table 1, Figure 2 and Figure 3.

Table 1
Increased Learning Motivation and Student Learning Outcomes between Cycle I and II.

	Learning Motivation Aspects	Cycle I	Cycle II	Escalation
Learning Motivation	Success Desire	85,34%	92,50%	7,16%
	Learning Need	78,28%	90,11%	11,84%
	Owning Expectation	89,93%	96,00%	6,07%
	Interest in problems	71,59%	88,97%	17,38%
	Learning Tenacity	82,62%	93,10%	10,48%
	Learning Motivation Average	81,55%	92,14%	10,59%
Learning Outcomes in Scientific Writing		55,17	88,45	33,28

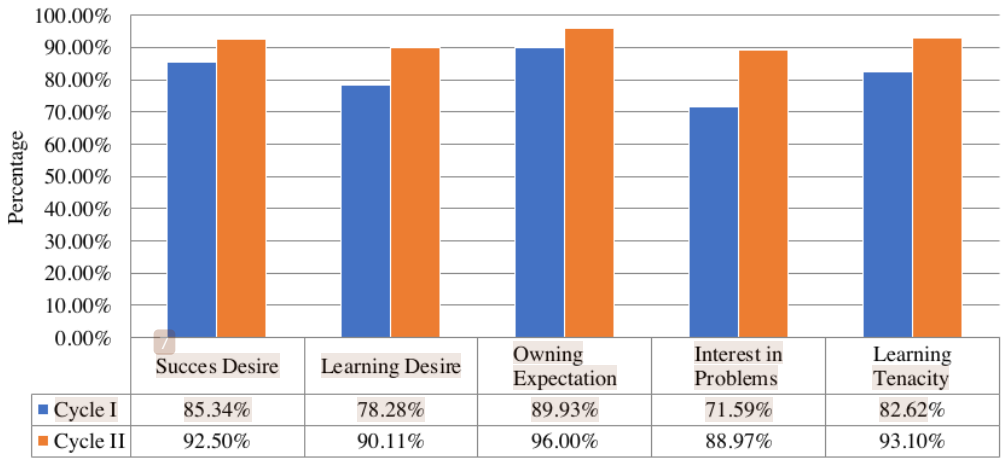

Figure 2. Comparison of Percentage of Achievement of Student Learning Motivation Indicators from Cycle I to II

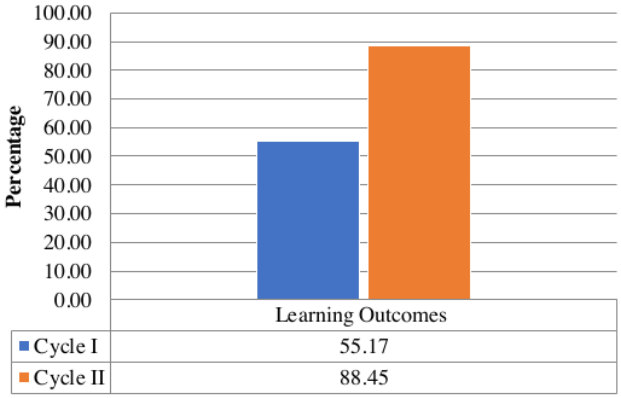

Figure 3. Changes in student learning outcomes in scientific writing from Cycles I to II.

The Simas eric model was developed based on constructivism learning theory. Students were guided to construct new concepts guided by constructive syntactic stages. At the skimming stage, students were only asked to read quickly on the study material provided, so that only the material points were recorded. In the mind mapping stage, students were asked to construct material points into two-dimensional images that were more visible in relation. Mind mapping activities of an individual and collaborative group are concrete activities using creative visual arts in exploring ideas and connect information that exists in mind to stimulate the thinking process (Muhlisin, et al., 2016).

In this stage, the expectation of students begins to appear to be able to make the mind map correctly according to the construction of the study material (Arahmat, Suratno & Wahono, 2017). The next stage, questioning, will bring expectation to students to get brighter and more detailed answers to the relationships of the points of material that have been known (Gall, 1970). In the end, that expectation will be realized when students go through the exploring stage as they begin to re-study the material more carefully and discuss with their groups to get answers of their learning expectations from previous step. The expectation increases in the percentage of 6,07%. Although not as big as the indicator of learning needs, but it still showed there was greater hope with the application of the learning model.

The characteristic of active learning according to Dunlosky et al., (2013) is learning that can raise problems and encourage students to solve these problems independently (without the help of lecturers). Based on Table 1, the indicator of interest in the problem increased by 17,38% from the first cycle to the second cycle, the increase was the biggest among the other indicators. Thus, the integration of the Simas eric model with blended learning can help students to increase interest in the problems that arise in the learning process.

The students were encouraged to solve problems. One of them was to make a design of cooperative learning in the Simas eric model, especially in the exploring syntax. In cooperative learning, students get the opportunity to be able to think critically, solve complex problems, and become life-long learners (Stefanou & Sailisbury, 2002; Darmawan, Brasilita, Zubaidah, Saptasari, 2018). Cooperative learning encourages students to show their abilities in one group. Students who have a low desire to learn can benefit from the existence of a workgroup that can bring confidence in learning. (Agrawal & Singh, 2011; Herrmann, K.J, 2013).

Tenacity in learning has an essential role so that students can achieve maximum learning achievement. The determination of education arises from the self-awareness of the need to learn. In the previous discussion indicators of student learning needs increased by 11,84%. The increase in learning needs encouraged students to be more diligent in learning so that in this study the learning perseverance factor increased by 10,48%. In Table 1, the average student learning motivation increased by 10,59%. This increase was an accumulation of increasing indicators of learning

motivation that arise during the learning process. Increased motivation to learn can have a positive impact on student learning outcomes.

Improving Students' Learning Outcomes in scientific writing using the Simas eric Model Interaction with Google classroom

The learning outcomes in this study were in the form of students' ability to write PKM for PIMNAS projects. In the first cycle after learned with the Simas eric model integrated with Blended learning, *the students* only obtained the score 55,17 on the average of a value. In the second cycle after learning with the same model an average score of 88,45 was obtained. There was an increase in learning outcomes by 33,28 points from the first cycle to the second cycle. In the first cycle, the average score of students was still low; it may occur due to the students still adjusted the learning model used. In the second cycle, the average score of students was relatively higher because students already have learning experience from the previous cycle, so that the readiness to participate in learning activities in the next time can be better. Improving student learning outcomes occurs along with increasing student learning motivation in learning that implements the integration of the Simas eric model with *Blended Learning*. It can be interpreted that habituating the integration of the Simas eric model with *Blended learning* in learning activities will increase student motivation and ultimately improve student learning outcomes in scientific writing. This result was in line with the research of Darmawan et al., (2017) that the Simas eric learning model (as an initial form of development of the Simas eric model) used in higher education has been potential to improve students' learning motivation and learning outcomes in scientific writing.

The relationship between motivation to learn and learning outcome has been revealed by several researchers (Taurina, 2015; Sari, Hartati, Dewi & Zuliyati, 2017; Wepe, Suratno & Wahono, 2016). Sari et al., showed a significant relationship between learning motivation and academic outcomes. Learning motivation is directly proportional to learning outcomes. The higher of motivation to learn, the higher the chance of increasing learning outcomes. Furthermore, Taurina (2015) argued that motivation arises from your needs and beliefs about how best to satisfy those needs. The need and ideas to get the best learning outcomes is an essential motivation in the case of this study. The combination of many factors such as motivation, the comfortable in learning and the influence of learning models from Simas eric as well as Blended learning were the causes of increased learning outcomes significantly (33,28 points). The synergistic effect of the two models has become its strength in the teaching and learning process in the classroom. The Simas eric is the essential guide that aims to reach the learning targets (Darmawan, 2015), while blended learning plays an essential role in maintaining comfort, attractiveness, and dynamism of the learning process (Guzer & Caner, 2014; Bonk & Graham, 2006). Thus we assume that the integration of Simas eric and blended learning is one of the powerful weapons to increase students' scientific writing skills in higher education.

CONCLUSION

Integration of Simas eric and google classroom models can increase students' motivation and learning outcomes in scientific writing subjects at the Universitas Tidar Biology Education Study Program. It is evidenced by increased learning motivation which reaches 10,59% and learning outcomes in scientific writing that increase to 33,28%.

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