Implementation of the IBSC Learning Model with Podcast Media Blended Learning Media System to Train Critical Thinking and Communication

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Abstract

This study aims to describe the effect of the IBSC model with the blended learning system podcast media on (1) students' critical thinking skills, (2) student communication skills, (3) describes the implementation of the IBSC learning model with the blended learning system podcast media, and (4) describes student responses to the IBSC learning model with blended learning system podcast media. This type of research is quasi-experimental with a group pretest-posttest design. The research targets were students of class X MIA 1, 2, and 3 of 69 students. The data were obtained through tests, observations, and questionnaires. The data were analyzed descriptively and statistically through a T-test with = 0.05 and the N-Gain test to see the effectiveness of the increase. From the results of the study, it was concluded that (1) the IBSC model influences critical thinking skills by increasing students' critical thinking skills in the medium and high effectiveness categories; (2) the IBSC model influences communication skills by increasing students' communication skills in the medium effectiveness category; (3) the implementation of the IBSC learning model with the Blended Learning system podcast media in each experimental class was carried out 100% in the outstanding category; and (4) students' responses to the IBSC learning model with the podcast media of the Blended Learning system on critical thinking skills and communication skills are categorized as very good.

INTRODUCTION

Education is an important activity and must be carried out to improve and develop the quality of human resources (Rahayu & Martini, 2019). The emergence of the problem of the spread of the COVID-19 disease on a large scale, which has an impact on the world of education, causes learning losses, so there is a need for innovation in the learning system. This is supported by the opinion of Ekantini (2020), who says that education is feeling the impact of COVID-19.

UNESCO data as of April 17, 2020, it is estimated that 91.3% or 1.5 billion students worldwide cannot attend school due to the COVID-19 pandemic (UNESCO, 2020). This impacts the implementation of distance learning, which has never been done simultaneously (Krismayanti & Sudibyo, 2021). Currently, the development of the COVID-19 pandemic has entered a new average era; namely, learning is returning to normal, even though it is still limited to face-to-face learning. So, it is necessary to implement a learning system that can integrate online/offline learning (*blended learning*).

In the new average era, blended learning is done offline and uses online media using synchronous and asynchronous multimedia (Dhawan, 2020).

In the 21st century, students must have critical thinking skills, creative thinking, communication, and collaboration. These critical thinking and communication skills need to be developed in students to solve learning problems, as well as in the community or workplace, and convey results well. This skill is essential because it forms the basis of all aspects of life (Haryanti & Suwarma, 2018). This research is focused on training students' critical thinking and communication skills. Critical thinking skills can support students' skills in solving a problem. Critical thinking in educational settings is an important issue, and developing critical thinking skills should be one of the main goals of educators at all levels (Gelder, 2005).

The ability to think critically in Indonesia is still relatively low. This is based on the 2015 TIMSS survey results and the 2018 PISA results. The 2015 TIMSS survey results stated that Indonesia was ranked 44th out of 49 countries (Nizam, 2016). The results of the 2018 PISA study show that the ability of students in Indonesia is ranked 70 out of 78 countries for science suspension, and the average score of Indonesian students reaches 389 with an average OECD score of 489 (Kemendikbud, 2019). In this study, the researcher decided to apply four aspects of Critical Thinking skills adopted from Ricard dan Paul Elder (2006), which consisted of (1) formulating problems, (2) providing arguments, (3) analyzing, and (4) conducting evaluation.

Communication skills are one of the 21st-century skills. Good communication skills can make learning active (Slavin, 2018). Communication skills influence student activity and achievement of student learning outcomes. In this study, researchers measured two communication skills adapted from Peni Suharti (2019): observation and presentation. The observation aspect has indicators (1) using the senses, (2) responding, (3) hands-on activity, (4) asking and presentation aspects having indicators (1) settings, (2) information content, (3) display, (4) how to act, (5) delivery, (6) respond to questions.

Active learning has a vital role in achieving 21st-century skills. One way to make students active is to apply learning models with varied methods and appropriate media. One of the media that can be used is podcast media. Podcast media is learning media in audio or video that can be accessed via the Internet. Podcast media is practical, flexible, trending, and creative media. This media makes it easy for students to download and access material and provides an overview before students start discussions (Copley, 2007). Through podcast media, students' communication skills can also be improved (Mayangsari & Tiara, 2019).

The learning model can also train critical thinking skills and communication; one of them is the Investigation Scientific Collaborative (IBSC) model because, in this IBSC model, there is an Investigation Collaborative syntax and a Collaborative Investigation Task (Suharti, 2019). Students are asked to conduct investigations collaboratively to solve problems in both syntaxes. The characteristics of the problems given to students include academic and authentic problems (Suharti et al., 2020). In both syntaxes, the teacher must facilitate students to have a positive dependence between students when solving problems given through worksheets. Positive dependence between students by fostering a sense of empathy for high-skilled and low-skilled students and generating courage in low-skilled students to ask their high-skilled friends, resulting in communication and collaboration among students.

The science and biology learning process emphasizes gaining practical experience to develop competence. Ecosystem material was chosen because this material can understand and interpret students in everyday life. Students must analyze ecosystem components and the interactions of ecosystem components (Reece, 2010). Based on interviews with the biology teacher at SMA Muhammadiyah 1 Surabaya, information was

obtained that the critical thinking skills of class X students were still low, with a daily test score of 60 out of a KKM score of 70. Moreover, students tend to be less active in online learning because class X is a transitional period from junior high school to high school. This makes the students' grammar when speaking and conveying material could be more fluent.

The learning device used in this study was adapted from the research results of Fakhrudin, N., & Suharti (2021). The development of IBSC Model learning tools to train students' critical thinking and communication skills in class X ecosystem material stated that the device was feasible. Based on the description above, the researcher is interested in researching "Implementation of the IBSC Learning Model with the Blended Learning Media Podcast System to Train Critical Thinking and Communication Skills of SMA Muhammadiyah 1 Surabaya Students".

METHODS

This type of research is quasi-experimental (Sugiyono, 2016). The research design used was one pretest-posttest group (Sugiyono, 2016). This research was conducted at Muhammadiyah 1 Surabaya High School, which will be held in February - March 2022. This study's target was Class X Mia students at SMA Muhammadiyah 1 Surabaya. Class X Mia 1, X Mia 2, and X Mia 3 were used as experimental classes. Data collection techniques include tests, observations, and questionnaires. The instruments used in this study were critical thinking skills test sheets, communication skills observation sheets, learning implementation observation sheets, and student response sheets. Data analysis techniques in this study used quantitative and descriptive statistics. Data on pretest and posttest values were statistically analyzed by t-test using SPSS version 25. Furthermore, the gain normality (N-gain) test is used to see how effective the increase is. Criteria for interpretation of the effectiveness of N-gain (Hake, 2002) can be seen in Table 1.

Table 1. N-Gain Value Criteria

N-Gain	Criteria
G < 0,7/70%	"High-g"
0,3/30% ≤ G ≤ 0,7/70%	"Medium-g"
G < 0,3/30%	"Low-g"

RESULTS & DISCUSSION

Results

Data on students' critical thinking skills pre-test and post-test results in the three experimental classes were processed using descriptive quantitative analysis and statistics. Data is presented in Table 2.

The statistical analysis results showed significant differences in the pretest and posttest scores of critical thinking skills in the three repetition classes. Based on the table above, it is known that the number of students in the experimental class X Mia1 is 23, X Mia 2 is 24, and X Mia 3 is 22. Each class's ideal value of critical thinking skills in ecosystem material is 100. At the beginning of giving, students' pretest scores were in the range of 61% -80% (critical category), 41% -61% (critical enough category), and 21% - 40% (less critical category). After being given the treatment, the IBSC learning model

with podcast media, the blended learning system, experienced an increase, as seen from the posttest results; students were at 81% -100% (very critical category) and 61% -80% (critical category). Based on the average N-Gain results of critical thinking skills in the three repetition classes, namely, 57.63%, 68.87%, and 75.76%, it shows that the increase in critical thinking skills after learning the IBSC learning model with the blended learning system podcast media is in the reasonably practical and very effective categories.

Table 2. Descriptive statistics on the value of critical thinking skills for class X MIA 1, 2, and 3

No.	Information	X MIA 1		X MIA 2		X MIA 3	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
1.	Subject	23	23	24	24	22	22
2.	Ideal Value	100	100	100	100	100	100
3.	Very Critical Category	0	18	0	10	0	18
4.	Critical Category	12	5	1	12	0	4
5.	Critical Enough Category	7	0	14	1	20	0
6.	Less Critical Category	4	0	9	0	2	0
7.	Average Critical Thinking Skills	57	88	43	76	48	84
8.	Average N-Gain	75,76 (High/Highly Effective category)		57,63 (Moderate/Quite Effective category)		68,87 (Moderate/Quite Effective category)	

The data on the results of the pre-test and post-test students' communication skills in the three experimental classes were processed using descriptive quantitative analysis and statistics—data presented in Table 3.

Table 3. Descriptive statistics on the value of communication skills for class X MIA 1, 2, and 3

No.	Information	X MIA 1		X MIA 2		X MIA 3	
		Pretest	Posttest	Pretest	Posttest	Pretest	Posttest
1.	Subject	8	8	8	8	8	8
2.	Ideal Value	100	100	100	100	100	100
3.	Very Good Category	0	7	0	4	0	7
4.	Good Category	8	1	5	4	8	1
5.	Good Enough Category	0	0	3	0	0	0
6.	Less Good Category	0	0	0	0	0	0
7.	Average Communication Skills	72	84,12	65	79,5	70,12	82,25
8.	Average N-Gain	43,47 (Moderate/Quite Effective category)		42,12 (Moderate/Quite Effective category)		40,82 (Moderate/Quite Effective category)	

The statistical analysis results showed significant differences in the pretest and posttest scores of the communication skills of the three repetition classes. Based on the table above, it is known that the number of students in the three experimental classes is

eight students. An ideal score of communication skills on ecosystem material in each class is 100. The students' pretest scores at the beginning of giving were 61% -80% (good category) and 41% -60% (good enough category). After being given the treatment, the IBSC learning model with the blended learning system podcast media experienced an increase seen from the posttest results of students in the 81% -100% (outstanding category) and 61% -80% (good category). Based on the results of the average N-Gain communication skills in the three repetition classes, namely, 40.82%, 42.12%, and 4347%, it shows that the increase in communication skills after learning the IBSC learning model with the podcast media blended learning system is in the category of quite effective.

Table 4. Analysis of the Implementation of the Investigation-Based Scientific Collaborative Learning Model (IBSC)

No.	Information	Meeting 1, Meeting 2, and Meeting 3		
		X MIA 1	X MIA 2	X MIA 3
1.	Percentage of Learning Implementation (PKP)	100%	100%	100%
2.	Average PKP	100%	100%	100%
3.	Average Step Mode	4	4	4
3.	Category	Very good	Very good	Very good

The results of the analysis of the implementation of the IBSC learning model at each meeting in the three experimental classes were implemented 100% with an average step score mode of 4 with an outstanding category. This means that IBSC learning is carried out very well overall.

Table 5. Student Response Analysis

No.	Information	X MIA 1	X MIA 2	X MIA 3
1.	Percentage of Responses Strongly Disagree	1,73	0	2,72
2.	Percentage of Responses Disagree	12,17	17,5	14,77
3.	Response Percentage Agree	70,65	56,25	60,90
4.	Percentage of Responses Strongly Agree	15,43	26,25	21,59
5.	Total percentage of positive responses	86,08	82,5	82,5
6.	Category	Very good	Very good	Very good

The analysis of student responses shows that most students respond positively to learning activities using the IBSC model with the blended learning system podcast media. It can be seen from the average total percentage of student responses of 86.08%, 82.5%, and 82.5%, which are excellent student response categories. This shows that learning using the IBSC learning model with a blended learning system podcast media is acceptable to students.

Discussion

Based on the data analysis above, the IBSC learning model with a blended learning system podcast media can improve students' critical thinking skills. They increase students' critical thinking skills after being given learning using the IBSC learning model because students solve problems collaboratively in their groups and hold discussions to solve problems in student worksheets (LKS) by obtaining the required

knowledge directly. Critical thinking is a skill that considers the information students get to produce an action or decision. This IBSC model facilitates positive dependency interactions between students by fostering a sense of empathy in students (Suharti, 2020). According to Fakhrudin, N., & Suharti (2021), the IBSC model can be used to train critical thinking skills because the IBSC model has a sharing task investigation syntax and a jumping task investigation.

Based on the data analysis above, the IBSC learning model with a blended learning system podcast media can improve students' communication skills. They increased the communication skills of students after being given learning using the IBSC learning model with podcast media because the IBSC model facilitates communication between students through collaborative activities to solve problems. Students do this using the syntax of the investigation sharing task and the investigation jumping task. In these two syntaxes, students collaborate in discussions to solve problems in student worksheets (LKS). When students collaborate, there will be communication between students; even in this syntax, the teacher is expected to facilitate positive interdependence between students so that collaboration and communication occur between students. Then, the results of solving these problems are presented in the form of presentations via the WhatsApp Group and podcast media.

Communication in the learning process also plays a role in building relationships or interactions between teachers and students who share thoughts, knowledge, and understanding (Chung et al., 2014). Discussions between groups guided by this teacher can develop students' thinking by encouraging them to be actively involved in learning, increasing attention and interest, and developing thinking skills. This aligns with Side et al. (2013), who said that group discussions could train students to learn by actively thinking, arguing, and asking questions. This is in line with the statement of Suharti (2019), which states that the IBSC model aims to train communication skills because, in the IBSC model, there is the syntax of sharing task investigations and jumping task investigations, which facilitates interaction between students in solving problems. To generate positive dependency among students.

The table of results of the data analysis of the implementation of the IBSC learning model in the third class of the experimental class showed that all syntax was implemented (PKP) 100% at meeting 1, meeting 2, and meeting 3. The mean mode score for each activity is four good; this indicates that the implementation of the activity is included in the outstanding category. The learning phase is done through the preliminary, core, and closing stages. In the sharing task collaborative investigation stage and the jumping task collaborative investigation, students are given a problem to be solved in groups. The blended learning system in the IBSC model in this study is divided into 2: collaborative asynchronous and virtual synchronous (Chaeruman & Mudiarti, 2018). At this collaborative asynchronous stage, they learn by applying learning with others wherever and whenever using discussion media such as blogs, chat rooms, and WhatsApp groups. This study uses WhatsApp groups to conduct presentations and discussions/questions and answers online, and the teacher guides students in solving the main problems in the LKS. Direct learning is implemented at this virtual synchronous stage, but it is carried out face-to-face simultaneously but in a different place. At this stage, students join in one virtual room via Google Meet to watch other groups' podcasts. The results of this podcast video are uploaded via Google Drive and YouTube along with the link.

1. Video podcast meeting 1
Googel drive : https://drive.google.com/file/d/1_y9xeE-ka5b_yPKu5gEsl-pql87aoOwd/view?usp=sharing
Youtube: https://youtu.be/E_7zEIWUBHk

2. Video podcast meeting 2
Googel drive :
https://drive.google.com/file/d/1jDAxFNZUWyHkDpJdQnBygORMjFtjaBn0/view?usp=sharing
Youtube: https://youtu.be/qEIXznjr_q8

Based on the student response questionnaire analysis results, it can be stated that all students gave a positive response in the outstanding category to the IBSC learning model with the blended learning system podcast media. The positive response from students was that they liked the new atmosphere, and they used the IBSC model with the Blended Learning system podcast media to train students' critical thinking and communication skills. This IBSC model provides new experiences for students so that students have a high enthusiasm for learning and are not bored. This is in line with the criteria of the IBSC learning model, namely 1) there are different roles among students in the group, 2) the group is heterogeneous, 3) there is a positive dependency among students, 4) The teacher has a maximum role as a mediator and facilitator in addition to being a guide. Podcasts state that podcasts are learning that is flexible, practical, creative, and easily accessible anywhere and anytime (Nadhianty & Purnomo, 2020). Students find it easy to get learning material and can repeat it. Moreover, the existence of a blended learning system can improve students' mastery of concepts and reasoning (Budiharti et al., 2015).

CONCLUSION

Based on the results obtained, it can be concluded that the Investigation Scientific Collaborative (IBSC) learning model with the Blended Learning system podcast media can train students' critical thinking and communication skills, according to research results which state (1) Investigation Scientific Collaborative (IBSC) learning model with media the Blended Learning podcast system influences the critical thinking skills of SMA Muhammadiyah 1 Surabaya students. The average value of N-Gain in the three classes is 57.56%. 68.87 %. Moreover, 75.76%, indicating an increase in critical thinking skills in the reasonably practical and effective category (2) The Investigation Scientific Collaborative (IBSC) learning model with the Blended Learning system podcast media influences the communication skills of SMA Muhammadiyah 1 Surabaya students. The average value of N-Gain in the three classes is 40.82%, 42.12%, and 43.47%, indicating that the increase in communication skills is quite effective. (3) The Investigation Scientific Collaborative (IBSC) learning model with the Blended Learning system podcast media for critical thinking and communication skills is implemented 100% in the outstanding category. (4) Student responses to the Investigation Scientific Collaborative (IBSC) learning model with the Blended Learning system podcast media for critical thinking and communication skills obtained positive responses in excellent categories.

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