Developing 21st Century Skills and Literacy Skills for Elementary School Students Through Constructivist-Based Planning and Assessment of Critical Engagement Models

Okta Rosfiani[1,*], Cecep Maman Hermawan[1], Astri Sutisnawati[2]

[1]*University of Muhammadiyah Jakarta*
[2]*University of Muhammadiyah Sukabumi*
[*]*Corresponding author. Email: okta.rosfiani@umj.ac.id*

ABSTRACT
Students' 21st-century skills are acquired through literacy. Teachers can train students to read, write, and solve problems using a mix of teaching strategies, and ePortfolios. However, in reality, the teaching carried out by teachers has not been able to develop students' 21st-century skills, due to the low literacy skills of teachers. This study aims to develop the 21st-century skills of elementary school students by improving literacy skills of reading, writing, speaking and problem-solving in Indonesian, Science, Social Sciences, and Citizenship Education subjects. This is done by providing technical guidance to elementary school teachers in designing constructivist lesson plans, worksheets, and reading literacy assessments. The findings suggest that the teacher follows all learning procedures in training students to acquire all 21st-century skills. The teacher develops students' creativity skills through project work that produces artifacts of students' work. The teacher develops students' collaboration/collaboration skills through small groups. The teacher trains critical thinking skills through literacy programs that support students to acquire many new words from new insights; The development of communication skills can be done by the teacher by preparing each student in turn to present their answers, ideas, and ideas. Problem-solving and inquiry skills in groups can be developed by organizing equality and involving all students.

Keywords: *21st-century skills, Literacy assessment, Literacy skills.*

1. INTRODUCTION

With the increase in self-learning skills based on individual academic fields, 21st-century skills will also increase (Karatas & Zeybek, 2020). 21st-century skills have been the focus of the Ministry of Education and Culture of the Republic of Indonesia since 2016, by organizing various literacy activities through the National Literacy Movement as part of the implementation of the Minister of Education and Culture Regulation Number 23 of 2015 concerning the Growth of Character.

There is a very strong positive correlation between early literacy and later literacy skills. This suggests that learners should be exposed to high-quality early literacy skills as early as possible to provide them with a foundation for future literacy success (Manten, Le Roux, Geertsema & Graham, 2020). Where the reading comprehension of third graders is predicted by their literacy skills in first grade (Liao, Kuo, Tsao & Mok, 2020).

A higher level of perceived self-efficacy in 21st-century skills is literacy (Thiel & Adam, 2019). Assessments should be related to 21st-century skills in the context of real-life design projects supporting self-evaluation and taking feedback (Klapwijk & Burg, 2020). Additionally, more class time was allotted to an individual or small group work in classrooms with higher average reading proficiency (Ruotsalainen, Pakarinen, Poikkeus, & Lerkkanen, 2022). As the knowledge required becomes more complex, the system in which we educate young people must also evolve. Intensifying the old practice of low-level instructional requests and standardized tests will not lead us to progress. Thus,

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educational excellence must be redefined (Nehring, Megin C-L & Stacy, 2019).

So far, however, there has been little discussion about developing 21st-century skills and literacy skills of elementary school students through constructivist-based planning and assessment. Therefore, the use of this constructivist-based planning and assessment aims to develop students' 21st-century skills through the development of student literacy skills, namely so that students can read, write, speak, and solve problems at the level of expertise required in the work, family, and community environment in which he or she is located. Because literacy is one of the important elements in the progress of a country in living life in the era of globalization.

The current studies contribute to our knowledge by addressing four important issues. First, develop students' 21st-century skills, which consist of critical thinking skills; problem-solving skills; communication skills; creativity and innovation skills; and collaboration/ cooperation skills. Second, developing students' literacy skills, which consist of reading skills; writing skills; and problem-solving skills. Third, the use of constructivist-based planning, implementation, and assessment models.

1.1. 21st Century Skills

The use of appropriate learning methods can bring 21st-century skills to teachers. Motallebzadeh, Ahmadi, and Hosseinnia (2018) explains that there are five sub-constructions of 21st-century skills critical thinking and problem solving, communication and collaboration, interpersonal skills, leadership, and technological literacy. Furthermore, teachers rank students' 21st-century skills regarding persistence, academic performance, curiosity, externalizing effects, behavioral problems, emotional symptoms, cognition, and academics (Woods- Groves, Woods- Groves, Choi, Bruhn & Fernando, 2019).

Hilt, Riesem & Søreide (2019) found that policy documents build the image of ideal students who are creative, responsible, cooperative, involved, self-regulating, and in full control of themselves, their learning, and their future. This thread of discourse shows how the characteristics of homogeneity associated with global ideas, as well as heterogeneity, are both seen in 21st-century skills.

Therefore, to support 21st-century skills, teachers are advised; (1) to foster creativity and innovation, teachers assign students to complete projects; (2) to foster critical thinking, teachers are advised to ask students to conduct discussions and ask students to post video responses; (3) to build communication and collaboration, teachers can ask students to make documents together (Yoo, et al., 2020).

1.2. Literacy Skills

Literacy skills can be acquired well through reading fluency (Bonifacci, Lombardo, Pedrinazzi, Terracina & Palladino, 2020). Reading/story-based activities carried out for a total of 30 hours in 6 weeks, significantly improved reading/writing skills (Yazici & Bolay 2017). Higher instructional support was associated with higher literacy outcomes for all children in the classroom. Likewise, the higher-class organization is directly related to higher class literacy skills (Bulotsky Shearer, Bichay-Awadalla, Bailey, Futterer & Qi, 2020).

In addition, ePortfolios are a good way to teach literacy skills. Therefore, a mix of teaching strategies should be used. Some students who were previously exposed to some literacy skills did not retain what they had learned (Fidalgo & Thormann, 2019). This is because linguistic background, socio-economic status (SES), home and school literacy environment, and reading attitudes were found to have a significant influence on reading literacy achievement (Netten, Luyten, Droop & Verhoeven, 2016). Therefore, it is important for parents to be sensitive to the performance of their children (Inoue, Georgiou, Muroya, Maekawa & Parrila, 2018).

Furthermore, the findings explain the 41% variance in students' reading achievement and provide evidence for the important role of teachers and parents in predicting an increase in reading literacy achievement scores. The absence of interaction with children from either parent who were not involved in homework activities or talking about school, teachers who did not succeed in implementing the curriculum, or making their expectations clear to students was statistically significantly associated with lower reading literacy achievement scores (Bergbauer & Van Staden, 2018).

Reading literacy skills are closely related to critical thinking skills and critical reading skills (Karademir & Ulucinar, 2017). Therefore, citizens need literacy skills (Majetic & Pallegrino, 2018). Therefore, the findings underscore the importance of literacy interests and highlight the role that children themselves play in choosing their literacy environment (Carroll, Holliman, Weir & Baroody, 2019). The findings also indicate a positive effect of the intervention on the development of literacy skills and students' self-efficacy beliefs (Kałdonek-Crnjaković, 2021).

2. METHOD

This research uses action research. Action research according to Creswell (2012) has an applied focus, using data collection based on quantitative and qualitative methods to deal with a specific problem. Through Spiral seeing, thinking, and actions reflect the action research process well. This process is called the interacting spiral by Stringer (2007).

The research participants involve our teachers and elementary school students who were selected by purposive sampling. This purposeful sampling is where the researcher deliberately selects individuals and locations to study or understand the central phenomenon. The school that participated in the study was one of the Ibtidaiyah Madrasah located in South Tangerang City, Banten Province, Indonesia which was included in the middle economic class. Thirty-two students and a sixth-grade homeroom teacher became the research participants in this study.

In this study, data were collected qualitatively and quantitatively. We collected qualitative data using interviews and questionnaires, as well as documents. Researchers interviewed teachers regarding the development of 21st-century skills, such as what are the processes of critical thinking skills, problem-solving, communication, creativity and innovation, and cooperative skills of fifth-grade elementary school students in constructivist classrooms, as well as questions regarding what reading literacy experiences are, writing, and solving student problems that have developed. The teacher answered questions from the researcher about how he carried out the lesson, told how his students worked on the project, and how it affected the student's reading literacy assessment. Whereas documents were obtained from the product artifacts of students' work.

Tests and observing the teacher's behavior were used in order to collect quantitative data. The test results from student learning were obtained from reading literacy questions on the topic: Come on, Learn Entrepreneurship, entitled "Creativity that Brings Results". While observations are based on field notes from observations of teacher and student behavior from the critical engagement model.

3. FINDINGS AND DISCUSSION

The stages of this action research refer to Stringer (2007) starting from:

See. Build a picture of 21st-century skills that will be developed through improving students' literacy skills. It is intended to assist stakeholder groups (primary school teachers) in building a picture of how to develop 21st-century skills through improving literacy skills. Where the process is through gathering information; recording/recording information; broadening understanding; organizing information and communicating project-based constructivist lesson plans and project/AWP assignment worksheets that have been designed to be implemented to students.

Thinking. Interpret and analyses 21st-century skills to be developed through improving students' literacy skills. This is intended to filter the collected information; identify elements of the teacher's experience and enable teacher participants to understand how project-based constructivist learning planning and assessment models affect 21st-century skills development and enhance their students' literacy skills. Through processes, and frameworks; categorizing and coding students' 21st-century skills acquisition and literacy skills; analyzing key teacher and student experiences; enriching the analysis using a framework of artifacts from student project results; writing reports collaboratively; presentation and performance of student project artifacts.

Act. Solving the problem of low 21st century skills and student literacy skills. It is intended to plan and implement practical solutions to these problems. Through the process, planning; implementing; reviewing; and evaluating the development of 21st-century skills and improvement of students' literacy skills starting from socialization and equalization of perceptions to the entire research team and participating teachers; providing technical guidance for designing project-based lesson plans; technical guidance on project assignment worksheet design; and technical guidance on designing reading literacy assessments in the subjects of Citizenship Education, Indonesian Language, Science, and Social Sciences for elementary school teachers; quantitative and qualitative data collection: administering tests to students, collecting documents from teachers and students, observing and interviewing teachers; review and evaluation of the acquisition of literacy skills in Citizenship Education, Indonesian Language, Science, and Social Sciences; review and evaluation of students' 21st-century skills acquisition.

3.1. Develop Students' 21st Century Skills

The following are the 21st-century skills that are transmitted by sixth-grade teachers through the use of critical engagement learning models in odd semesters for the content of Indonesian, Science, and Social Science lessons. The chosen ones are theme five, sub-theme three, and learning one about entrepreneurship, with the topic "Let's Learn Entrepreneurship".

3.1.1. Observations on the Implementation of the Critical Engagement Model

Phase 1: Towards a Democratic Class

The Behavior of the Sixth Grade Teacher and Students

- The teacher tells the students that the control in the class is divided into three ways (the activity can be seen in Figure 1), namely:
  1. Teachers take part in determining students' 21st-century skills, the purpose of the learning experience that will be offered is entrepreneurship experience, and the means used to provide feedback are used goods in their respective homes that can become "Creativity that Delivers Results".
  2. The activity that the students decided to do was sub-theme three in lesson one about “Come on, Learn Entrepreneurship”.

Figure 1 Reading the text "let's learn entrepreneurship".

3. The last third is negotiable. Teachers are transparent about the value that will be achieved if students can achieve the targets that have been determined together. In this negotiation activity, the teacher only acts as an observer of student discussions.

Phase 2: Dialogue and Strength in Class

Teacher and Student Behavior

- Project. Make a product of creativity that you think can generate selling value. Give students time to think about and make it with parents for the next week, then set a time to collect, and present to all students and teachers in the class (creativity skills and communication skills).
- The teacher makes small groups with no more than three members.
- Students are given a problem about the ASEAN Economic Community / MEA until questions arise regarding the problem and are answered in group discussions (collaboration/collaboration skills). (Five questions on MEA for critical thinking skills).
- From each group give one problem about MEA which will be discussed together.
- The teacher selects several MEA problems to be discussed and then discusses them with all students in the class (students debate in groups for communication skills). All of the steps in phase 2 can be seen in Figure 2.

Phase 3: Critical Thinking and Critical Incidents

Teacher and Student Behavior

- The teacher asks students to examine trading in the MEA free market, and how learning about AEC can affect students' future (problem-solving and investigation skills).

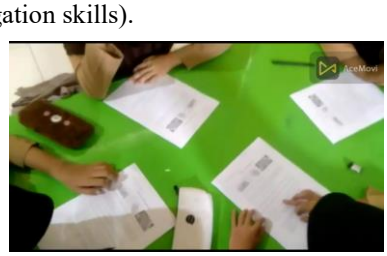

Figure 2 Discussion in small groups.

Figure 3 Student creativity photo frame from used materials.

- Presentation of experimental reports in groups (communication skills). The results of phase 3 can be seen in Figure 3.

Phase 4: Global Engagement

Teacher and Student Behavior

- The teacher asks students to relate the sub-theme learning: Come on, Learn Entrepreneurship" with students' personal experiences in overcoming environmental problems.
- The teacher asks students to connect two different forms of knowledge; from the experience of students making creativity from used materials, based on students' academic knowledge, namely how creativity is useful for their lives in the future through entrepreneurship (critical thinking skills and collaboration/collaborating skills). The results of phase 4 can be seen in Figure 4.

The results of field notes from observations of teacher and student behavior from the critical engagement model show that there is one teacher behavior that is not implemented, namely where the teacher should instruct students to present experimental reports in groups to develop student's communication skills so that the

Figure 4 Character glasses for pencil cases from students' work that is worth selling.

acquisition of students' communication skills cannot be known.

This finding highlight that following all learning procedures is an important factor in training students to acquire all 21st-century skills.

3.1.2. Development of critical thinking skills

The following is the teacher's explanation based on interviews regarding the acquisition of students' critical thinking skills:

> *"Students' critical thinking skills are lacking. 1. because students have just discovered the context of the ASEAN Economic Community (AEC), 2. also because students' reading comprehension is still weak; 3. students are lazy to read."*

3.1.3. Development of problem-solving skills

The results of interviews regarding students' problem-solving and investigative skills are as follows:

> *"All students are familiar with magnets. When presented with magnets, some students already understood. Only the types and forms of magnets are still not understood by students. Investigations on magnets were carried out in groups. Each group consists of five people, and only two groups are active, the rest follow the opinions and arguments of other groups.*

3.1.4. Development of communication skills

Interviews with teachers regarding the acquisition of students' communication skills are:

> *"Communication skills have started to improve, but students who are relatively good at communicating tend to dominate conversations in class. Students whose communication has not developed, tend to follow students who they think are better."*

3.1.5. Development of creativity and innovation skills

An exploration of the development of student's creativity and innovation was obtained from the following interviews:

> *"I instruct students to make a creative product that they think can generate selling points. Initially, I instructed students in groups, but some students worked independently. And each student has an idea to make their creations. Each student then brings and exhibits their work. They have made it according to their respective abilities and creativity, it is not too difficult for the students."*

3.1.6. Development of collaboration/ cooperation skills

The results of the interview show that students' collaboration/cooperation skills have developed, but collaborative discussions in small groups tend to be weak, as follows the teacher's explanation:

> *"Regarding collaborative discussion, students who seem good at collaboration/cooperation are only shown by two to three male students, while there are three to four female students. There are one to two students who are critical, while other students tend to follow, and just silently observe. There were 32 students involved at the time."*

The discussion of the findings begins with the creative skills that students can acquire from project work assigned by the teacher through collaboration with students and their parents in producing an artifact of student work. Collaboration is needed in learning between teachers, students, and parents (Rosfiani, Kuswiyanti & Abdultawab, 2021). Meanwhile, collaboration/collaboration skills among students can be trained in forming small groups. Where teachers can apply the group investigation (GI) cooperative learning model for the acquisition of collaboration skills, because GI is proven to be effective for encouraging students' involvement in learning, training students' higher-order thinking skills, and promoting collaboration behavior to complete the task (Rosfiani, Kuswiyanti & Abdultawab, 2021).

This finding provides evidence that critical thinking skills can be trained by teachers through literacy programs that support students to have a lot of new vocabulary acquisition from new insights gained from reading literacy. This finding highlights the low communication skills of students because teachers do not provide opportunities for all students to communicate regularly in class, so teachers need to familiarize each student, in turn, to get the opportunity to express their answers, ideas, and ideas either voluntarily or with strong encouragement from others. teacher. And teachers need to give appreciation for every student's answer, even for wrong answers. In addition, the teacher must also provide positive feedback on student answers, which is useful as a reflection for students. For this reason, teachers can adopt the Jigsaw type of cooperative learning model, because Jigsaw has been proven to be able to increase knowledge of pedagogical content and verbal communication skills (Sudin, Hermawan, Rosfiani, Ristiawati & Hasanah, 2021).

Our finding revealed that the low problem-solving and investigation skills could be due to the lack of involvement of some students because only certain students dominate the investigation project. For that, the teacher needs to regulate the equality and involvement of all students in the group (if the investigation is in groups). Teachers can also adapt the inquiry model during the investigation and problem-solving process because the inquiry model can improve student learning outcomes (Rosfiani, Hermawan, Sahal & Mawartika, 2020).

3.2. Student Literacy Skills

Students are given a test to measure their literacy skills. The forms of questions that students do are multiple-choice, complex multiple-choice, and descriptions, for types of questions that test higher-order thinking skills. The results showed that two students scored 100, twenty-five students scored 75, and five students scored below 50.

4. CONCLUSION

This paper argues that following all the procedures of the constructivist learning model from planning, implementation, to assessment is key to successful 21st-century skills development. This study highlights the importance of teachers' trust in all their students. This study also underlines that the competence and past experiences of teachers, especially when they were students and acquired 21st-century skills and literacy skills, were proven to contribute to their teaching.

This paper also argues that literacy activities can improve literacy skills as well as critical thinking skills, where students are possible to gain a lot of new vocabulary from new insights.

The evidence from this study suggests that parental involvement is needed in supporting the acquisition of 21st-century skills, solving problems and working on joint projects among students in small groups needs to be maintained in the classroom, and teachers must build a classroom climate that provides opportunities for all students to express ideas, ideas, and answers consistently, the teacher must regulate the equality and involvement of all students in the group (if the investigation is in groups). Further research might explore another newer constructivist learning model, with more challenging literacy assessments applied at other grade levels to assist teachers and schools, and governments in their efforts to develop students' 21st-century skills, and improve student literacy skills in the wider school context.

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