Innovation model of citizenship education learning in the 21st-century skill-learning environment of students in Aceh

Iwan Fajri[1], Rusli Yusuf*[2], Maimun[3], Budi Azhari[4], Sanusi[5], Yusran[6]

[1]Departemen of Civic Education, Faculty of Teacher Training and Education, Universitas Syiah Kuala, Banda Aceh, Indonesia, Departement of Technology Information Education, Faculty of Education and Teacher Training, Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

[2*]Departemen of Civic Education, Faculty of Teacher Training and Education, Universitas Syiah Kuala, Banda Aceh, Indonesia

[3]Departemen of Civic Education, Faculty of Teacher Training and Education, Universitas Syiah Kuala, Banda Aceh, Indonesia

[4]Departemen of Mathematics Education, Faculty of Education and Teacher Training, Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

[5]Departemen of Civic Education, Faculty of Teacher Training and Education, Universitas Syiah Kuala, Banda Aceh, Indonesia

[6]Departement of Technology Information Education, Faculty of Education and Teacher Training, Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

[2*]rusliyusuft@unsyiah.ac.id

ABSTRACT: The purpose of this study was to determine the effect of the project citizen learning model to improve the 21st-century skills of students in Aceh. The hypothesis in this study posits a significant influence of the improvement of the 21st-century skills of student's through project citizen learning on students studying under conventional methods. This research used a quantitative approach with a quasi-experiment pretest–post-test nonequivalent control group design. The sample of this study was 200 high school students in Aceh selected from four schools and eight classes spread across Aceh. The data in this study were collected through a 40-item questionnaire developed from previous studies and were modified to fit into the environment of the current study. The finding shows that the 21st-century skills of students in the experimental and control classes increased by 0.233 and 0.621 before and after the treatment, respectively. The results also revealed a significant influence on the use of the project citizen-learning model on improving the 21st-century skills of students in Aceh. This influence was indicated by the value of Sig. (2-tailed) of 0,000 <0.05 with a mean score in the experimental class of 4.133 and the control class of 3.642. Thus, the project citizen learning method can improve 21st-century skills of students in Aceh. Teachers who are responsible for other subjects are expected to be able to use the project citizen learning model to improve 21st-century skills with materials that are in line with the steps of project citizen learning.

KEYWORDS: 21st century, project citizen, students, learning models, civics education

I.   INTRODUCTION

Education is the most critical aspect in empowering people to face increasingly complex global challenges. Through education, people can develop various potentials, intelligence, personality skills and character that can adapt to the changes in the 21st century. Knowledge has become vital, and people need to acquire the skills required in this century to enter the workforce. In general, 21st-century skills include collaboration, communication, critical thinking, problem-solving, creativity, innovation, productivity, digital literacy and ICT utilization skills [1]–[5]. According to Van, 21st-century skills are needed to find and evaluate information, solve

problems, exchange information or develop ideas in a digital context; such skills are considered essential to thrive in society [6].

Twenty-first-century skills are considered fundamental in the lives of people [7]. Work in the 21st century requires technical preparation for proper completion; in addition, workers need sufficient skills to adjust to the requirements of the work itself [8]. Thus, educational institutions must support a framework that can improve the 21st-century skills of students. Education must be oriented towards developing the need for educators to equip students with a holistic education that emphasizes life skills, such as communication, cross-cultural collaboration, problem-solving and critical thinking [9], [10].

Twenty-first-century skills are a set of abilities that students need to develop to face future challenges involving learning skills, technological literacy and life skills [11]. In the 21st century, students are not only assessed by testing their ability to answer questions but also by checking their level of knowledge using 21st-century skills, such as problem-solving, critical thinking, collaboration, communication, creativity and innovation [12].

According to Higgins, education needs to adapt to the global context and meet the needs of students, specifically those needs related to 21st-century skills and digital skills [13]. Teachers must ensure that the ongoing learning process can improve the ability of students, especially those related to 21st-century skills. According to Leahy, teaching and learning practitioners must mainly focus on education oriented to the mastery of 21st-century skills [14]. Educators are one of the variables that determine the quality of education. According to Rusli, the low-quality performance of the teaching staff is a significant problem faced by the education sector in Indonesia. [15]

Directing individuals to master 21st-century skills are strongly influenced by the way the teacher instructs and how the students learn in the process. The global challenge faced by teachers today is how to prepare students for the changing world by developing student skills in general [3], [4]. Many suggestions for teaching programs and strategies that discuss developing thinking skills have been raised [16], [17]. Learning strategies and models become essential points to success in the learning process in school. Learning strategies and models become essential points to success in the learning process in school. Low-level thinking skills amongst students, which are caused by the learning strategies used in the classroom, are still less effective and not optimal for improving high-level thinking skills [17].

Students must possess 21st-century skills, including work habits and characteristics that are essential for achieving a successful life. These skills must be obtained by influencing the quality of learning and helping students to develop participation, critical thinking, creativity, collaboration, communication and innovation [15], [18]. The Indonesian government has developed the 2013 curriculum as a response to the changes in the learning process due to the demands of the times. The 2013 curriculum is oriented to enrich Indonesians who are productive, creative, innovative and practical [11], [19]–[23]. This orientation is an effort to meet the demands of 21st-century skills, but a follow-up is needed in the learning process in the classroom. In this case, a learning strategy, model and approach that can develop the 21st-century skills of students are needed during the learning process.

Innovative learning strategies, models and approaches are crucial to maximize the results of the learning process. Students can obtain the expected results because the teacher correctly chooses the model that is suitable for the materials and conditions of the learning environment [24]. In the context of the 2013 curriculum in Indonesia, the recommended learning models are project-based, problem-based, discovery-based learning models and involves inquiry and guided learning [25]–[27]. The application of this model is expected to develop the skills of students, especially those related to 21st-century skills. A project-based and problem-based model of inquiry is one of the alternative learning models that is aligned with the activeness of students to obtain learning skills and innovation, amongst which is critical thinking [27].

Efforts are needed to improve 21st-century skills, especially the learning and innovation skills of the students. In this case, the project citizen learning model is an alternative that can improve these skills. This proposal is in line with Jayadiputra, who explains that the project citizen model can be implemented to improve the quality of Citizenship Education learning with a process that can improve critical thinking [28], communication, participation and innovation [29], [30] which are part of 21st-century skills. Such notion is line with the experts who state that the project citizen model is a learning model based on issues that occur in the community environment related to public policy [31]. The novelty of this research with the existing studies lies in the learning model used. In general, no research has been done to measure the 21st-century skills of students as a whole with the project citizen model. Instead, previous research has only measured one part of 21st-century skills, including critical thinking skills [28], collaborative skills [29] and the enhancement of digital literacy skills through the project citizen model [32]. Moreover, the research that has been conducted to examine the 21st-century skills of students as a whole through a project-based learning model is an innovative approach to success in the 21st-century [33]; this model also takes a problem-based approach to explore 21st-century skills through online courses [1], [33], [34].

On the basis of the various descriptions above, a project citizen model must be applied to improve the skills of students to face challenges in the 21st century. This study only focuses on learning and innovating skills which consist of collaboration, communication, critical thinking, problem solving, creativity and innovation skills. This study aims to test the hypothesis that the project citizen model has a positive influence on the 21st-century skills of high school students in Aceh province. The results of this study are expected to be the latest reference in the implementation of learning models to improve the 21st-century skills in schools.

II.   METHOD

1.1.   Participants

Participants in this study were 11th-grade high school students in Aceh. The research sample consisted of eight whole classes from four high schools that were randomly chosen, representing each region in Aceh through multistage sampling. A total of 200 students were selected from the eight classes. They were divided into two groups consisting of 100 students in the experimental group, which used the Project Citizen model and 100 students in the control group, which used the conventional model in each selected school.

1.2.   Material

This study was a quasi-experimental type of study with a pretest–post-test design of a nonequivalent control group. Quasi-type experiments were used because the study samples were human; therefore, perfect control could not be carried out [35]. The use of the pretest–post-test design in this study aimed to examine the differences in the 21st-century skills of students between the group with initial conditions (pretest) and the group with final conditions (post-test) using statistics. The experimental class was given treatment using the project citizen model, whilst the control class was given the conventional learning process. The following research designs are illustrated in the table below [35], [36].

Table 1. Pretest–post-test design of nonequivalent control group design

| Group	Prestest	Treatment	Posttest
Experimental	O_1	X_1	$O3$
Control	O_2	X_2	$O4$

In Table 1, E refers to the experimental class, K is the control class, X1 is the project citizen model treatment, X2 is the conventional model treatment, O1 is the preliminary test of the 21st-century skills of the experimental class, O2 is the preliminary test of the 21st-century skills of the control class, O3 is the final test of the 21st-century skills of the experimental class, and O4 is the final test of the 21st-century skills of the control class.

This research was conducted in the Pancasila and Citizenship Education subjects of 11th-grade students during normal school hours. The students gathered for 80 minutes a week for four weeks in each school under this research with materials about the threats to the Republic of Indonesia [37]. The samples in the control class were instructed through conventional models using ordinary learning materials, such as textbooks and practical books that had been mandated by the national curriculum of Pancasila and Citizenship Education. Meanwhile, the sample of the experimental class was given a project citizen learning model in the form of a portfolio that used other materials besides the existing textbooks. Before the learning process, a preliminary test about the 21st-century skills of both classes was given. After four weeks, the final test regarding 21st-century skills was given.

In this study, the instrument used was a set of questionnaires consisting of two parts. Part A contained student information, such as gender, age and level. Part B included 21st-century skills. Researchers used instruments to improve 21st-century skills as part of the learning and innovation strategies developed by [4], [38], [39]. In this study, researchers only selected 40 items consisting of indicators of collaboration, communication, critical thinking, creativity, innovation and problem-solving skills that had been modified according to conditions in the field. Each item was measured on a 5-point Likert scale with five possible alternative answers ranging from strongly agree (5 points) to strongly disagree (1 point). This instrument was retested with a reliability of 0.936. Hypothesis testing analysis was conducted using an independent sample t-test with the help of SPSS version 22 for Windows.

III.   RESULT

The data collection in this study was carried out in four schools in four districts in Aceh Province with 200 high school students as the sample. Statistical test results for the pretest–post-test from each group found the average value, which can be seen in Figure 1.
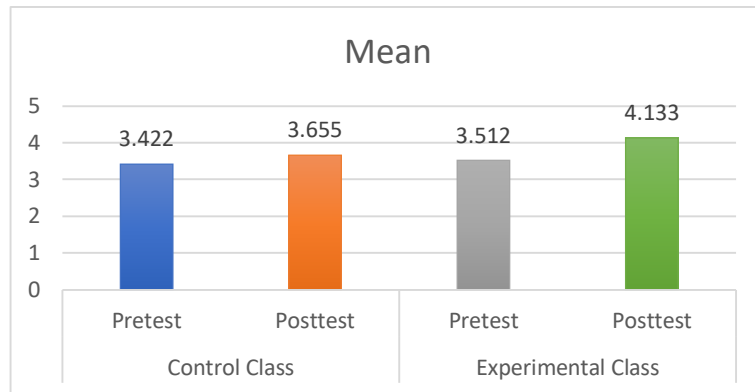
Figure 1: The average value of 21st-century skills in control and experimental classes

Figure 1 shows the average value of 21st-century skills obtained from the control class and the experimental class. The analysis of the data shows that the pretest value of the control class was 3.422, and the post-test value was 3.655 with a difference of 0.233. Meanwhile, the experimental class showed a pretest value of 3.512 and a post-test value of 4.133 with a difference of 0.621.

After determining the average of each test, before, and after the control and experimental classes, the results of the 21st-century skills statistical test is explained in the learning and innovation skills section of the post-test of the experimental class using the project citizen model. The purpose of the analysis is to see the overall results of each indicator of learning and innovation skills that are part of 21st-century skills. The results of data analysis show that the skills for learning and innovation has an average of 4.13, a range value of 1.30, a minimum value of 3.42, a maximum value of 4.72 and a standard deviation value of 0.304.

Before testing the hypothesis, the research data needs to be done first to test the normality of the data so that the hypothesis testing process can be done. The results of the 21st-century skill normality test in the control class and the experimental class are normally distributed. This normality is evidenced by the results of the analysis using the SPSS application program by obtaining a significant value of more than 0.05 (Table 2).

Table 2. Test of normality results

Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Eksperimental	,072	100	,200[*]	,986	100	,359
Control	,088	100	,055	,976	100	,070

* This value is the lower bound of the true significance.

[a] Lilliefors significance correction

The current study uses hypothesis testing independent test sample t-test, which is a technique for analyzing the results of data from the control class and the experimental class. The results of the data analysis have found that the number of the research samples in the experimental class amount to 100, and that of the control class amount to the same. Then, the results of the analysis reveal that the control class has an average value of 3.64 and a control class has 4.13 (Table 3). The SPSS output shows that the F count Levine test is 1.484 with a probability of 0.228. Given that the value of probability is > 0.05, the data from both classes have the same variance [38].

Table 3. Group Statistics results

	Group	N	Mean	Std. Deviation	Std. Error Mean
21st Century	Experimental	100	4.13325	.304865	.030486
	Control	100	3.64275	.280833	.028083

If the data requirements of the test results for the testing hypotheses are met, including normal and homogeneous, then the next test is to determine whether the project citizen learning model improves 21st-century skills between the students of the experimental class and the control class using an independent sample t-test using SPSS 22.

Table 4. Independent sample t-test analysis results

		Levene's Test for Equality of Variances		t-test for Equality of Means							
							Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)			Lower	Upper
21st Century	Equal variances assumed	1.464	.228	11.834	198	.000	.490500	.041450	.408760	.572240
	Equal variances not assumed			11.834	196.680	.000	.490500	.041450	.408757	.572243

Table 4 shows that the results of the independent sample t-test analysis obtained significant values (2-tailed) of 0.000 <0.05. As the basis for decision making in the independent sample t-test, significant differences are found between 21st-century skills in the control class and the experimental class. Thus, a significant influence on the use of project citizen learning models is present in improving the 21st-century skills of students.

IV.   DISCUSSION

This study investigates the effect of the project citizen learning model in improving the 21st-century skills of students in Aceh. Project citizen learning is project-based, and the problem consists of six steps that must be passed by students whilst doing the assignments given by the teacher. The purpose of learning is to improve and multiply the various potentials of students. Every student has their own potential; the teacher simply needs to develop and direct these potentials to be improve and become useful.

In addition to the problem-based model, project-based learning is a portfolio-based model which not only develops science but also the soft skills or skills needed by students in the 21st century. Project citizen is a program that can promote the participation of competent and responsible citizens by involving students in influencing and monitoring public policy [40]. Project citizen encourages students to analyses problems, collect assignments and make creative presentations [41]. Teachers in high schools from various subject areas can adapt the project citizen model to improve the skills needed by students in the 21st century. Thus, this study emphasizes citizenship education lessons [42] in developing the 21st-century skills that students need as they enter the real world.

The steps in project citizen learning include identifying problems, choosing problems, gathering information, developing class portfolios, presenting class portfolios and learning experience reflections. Each step mentioned above has activities that can encourage students to be active in the learning process. Thus, the learning process is centered on students and requires them to build their knowledge in the process. Developing and constructing the knowledge of each student as the learning process takes place is part of the theory of constructivism. Constructivism states that the learning process must involve students in the active development of the knowledge that exists within themselves [43].

The first step in project citizen learning is identifying a problem. Thus activity requires students to read and think critically in identifying problems that occur in society regarding the threats to the Republic of Indonesia. Critical thinking and reading are part of 21st-century skills [8], [38] that must be mastered by students through their learning tasks. The level of critical thinking of students through project citizen learning is adequate, as this step encourages students to engage in the learning activities. This activity is consistent with the results of research that explains that the project citizen model can create smart and good citizens who have high critical strength, as well as those who actively and responsibly participate in the social affairs of the nation and state [28], [44]. Multidisciplinary project-based learning can improve the critical thinking of students and the collaboration skills in schools [45]. The novelty lies in the use of learning models, namely, project citizen. In addition to being problem-based, project citizen learning is also portfolio-based, which invites students to be active throughout the learning process with complete and systematic steps. In developing citizenship literacy, students must be actively involved in learning activities. Apart from the classroom, students must also participate within the community to identify its various problems through project citizen learning [46]. A relationship exists between the learning process outside and the level of critical thinking of students in mastering a concept [47]. Thus, teachers must pay attention to where the learning process takes place [38].

The second step is choosing the problem to be studied in class as part of the learning task. Problems are selected on the basis of the problems that have been collected in the previous steps in the study materials. In this activity, students are required to work together in determining what problems to choose and why they are important to study. This activity facilitates the creation of collaborative skills, problem-solving, communication skills and critical thinking skills. Problem-based learning models, such as Project Citizen, are intended to develop a variety of skills, including problem-solving, communication and critical thinking [48]. Other studies reveal a significant effect of problem-based learning on the critical thinking skills of students [49].

The third step is gathering information from the problems that have been selected in the previous step. Students are required to gather as much information as possible to solve the problems studied in the previous step. The process of this activity invites students to participate actively together to look for various information ranging from books, journals, online media, magazines and others. The skills formed in this step are communication, problem-solving and critical thinking. Various studies have highlighted the importance of public participation in information technology and social media [50]. Communication is an important skill in the sector to multiply information and translate existing information [6] and to ensure that the meaning conveyed can be understood by the audience by adequately considering environmental conditions [50], [51]. Moreover, problem-solving skills emerge as to overcome the various kinds of problems from the information obtained [52].

The fourth step is developing a class portfolio on cardboard to present the various information collected in the previous step. This activity invites students to play an increased active role. In addition to creative skills, innovation skills are also essential in making portfolios to improve results, thus leading to a renewal of the previous learning models. One of the adaptive learning models that are currently being developed in Indonesia is a model of citizenship learning practices, that is, a project citizen wrapped in a portfolio of student work [45]. In this activity, students create a portfolio based on ideas from the information obtained in the previous step. Then, these ideas are linked to one another and wrapped into a single unit to form critical thinking skills. Learning activities with the help of media or visual tools significantly help students to understand quickly and increase memory retention [53], [54]. The results show that the use of electronic portfolios in virtual-based learning can improve creativity, problem-solving and critical thinking [55].

In addition to critical thinking, creativity also emerges in this type of learning. Among the products produced by students are those made in the form of portfolios. Given that making portfolios is part of evaluating the presentation in the next step, one of the assessments involves cooperation in explaining the work of each group. Basically, this project citizen model has actual features that require the participation of all groups in the community as citizens [56]. Innovation skills also emerge in this learning process because one of the assessment processes conducted by the jury in the next step determines how well the portfolio is displayed by students when presenting in the next step. This project citizen has been recognized and has been proven to expand the democratic intelligence of citizens or students through portfolio-based learning [57].

The fifth step is presenting a portfolio of student works in the previous step on the basis of the information collected from various sources of information. This activity is the culmination of project citizen learning, where each group of students must present the results of their collaboration in the previous steps. This section involves research on topics chosen by students in the previous step, such as portfolio documentation presented to other groups and expert members [58]. In this activity, the skills that emerge include communication skills and collaborative skills. Communication skills arise when students present their portfolios. At this time, a dialogue and an exchange of arguments occur amongst students. Learning activities that require group work contain effective learning process and positive responses from other students [59]. Students must cooperate with one another to present their work in the previous step so that collaboration skills emerge. Discussion activities can help students in answering and comparing various sources of information available, thus giving birth to other new innovations [60].

The sixth step is the final step in project citizen learning. This step requires students to reflect on the learning experience from each previous step. The teacher provides an assessment of the portfolio project that has been made and presented by students to the jury and other participants who have participated in listening to the work. In this step, students are required to evaluate themselves according to what they have accomplished. They are required to think critically about what has been done and take responsibility to provide a brief description of the portfolio that has been made. In addition to critical thinking skills, communication skills also appear in this step. Students must convey in a concise and eloquent manner with language that is easily understood by other participants.

V.   CONCLUSION

The results and discussion of this study indicate a significant influence of the improvement in the application of the project citizen learning model on the 21st-century skills of students. Moreover, the results of the data analysis show an increase of 0.621 in the experimental class that used the project citizen learning model. The learning steps for project citizen include six steps, ranging from identifying problems, selecting problems to be studied, gathering information, developing class portfolios, presenting portfolios and reflecting on learning experiences. The results of hypothesis testing obtained a significant value (0,000) <0.05, which entails a significant influence of the project citizen learning model in improving 21st-century skills. The results reveal that the project citizen learning model can improve such skills. Thus, teachers of various subjects should use the project citizen learning model to improve 21st-century skills using appropriate materials to facilitate the steps in project citizen learning.

VI.   REFERENCES

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