

The Effect of Online Learning Based on the Glee Tradition on Students' Environmental Knowledge in Higher Education

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The declining of environmental quality is now a global issue that needs to be discussed and to find solutions. One of the solutions is through education, especially higher education. There is a subject aimed at environmental preservation, which is environmental geography. The purpose of this study was to determine the effect of online learning based on the glee tradition with environmental knowledge and concern. This study used a quasi-experimental method and equivalent control group design. The subjects in this study were students in geography education major of 2017 at Samudra University, Indonesia. The data was collected through tests and questionnaires that had been issued. The data were analysed using parametric statistical measurements, namely t-test and ANCOVA test. The results showed that learning based on the glee tradition has significant value (0.0000) on students' environmental knowledge and concern. Also, there are interactions on all variables, especially environmental knowledge, which has more effect on concern than on learning.

Key words: *Learning Based on Glee Tradition, Online Learning, Environmental Knowledge, Environmental Concern.*

Introduction

The 21st century is known for the era of globalisation and the very rapid and dynamic development of science and technology (Inguva et al., 2018). The development has a significant impact on the progress of human civilisation, and all the perceived ease and comfort makes human life more prosperous (Mayasari, Kadarohman, Rusdiana, &

Kaniawati, 2016). However, aside from the positive impact, the progress of science and technology also has a negative impact on human life, especially the environment (Kurniawan et al., 2019). Examples of environmental damage are air pollution, deforestation and environmental pollution by waste (Fikri et al., 2020).

Learning in the 21st century requires university students to master not only their major but also life skills in adapting to global issues and the rapid development of science and technology (Shelest et al, 2017; Ridha, Utaya, Bachri, & Handoyo, 2019). As one of the current global issues is environmental damage, so students are expected to be individuals who care and are ready to save their environment (Kongson, 2020).

Environmental knowledge and environmental concern have become the centre of attention of researchers aiming to solve environmental problems that are increasing (Biologi, 2013; Minds, 2015; Ham et al, 2015). Various studies have discussed and examined knowledge, attitudes and behaviours of environmental concern that can be formed through learning at various levels, including in higher education (Takahashi & Selfa, 2015; Putri et al., 2020). Therefore, appropriate learning in the 21st century must be student-centred to generate environmental knowledge and concern (Asrowi, 2017). Then students are taught to collaborate, the material taught has an impact on daily life, teaching students to empathise with the environment around (Sari et al., 2019; Aristin et al., 2020).

Some previous studies concluded that environmental knowledge and environmental concern could be formed through learning (Lathifah & Wilujeng, 2016; Sumarmi, 2017). The 21st-century learning implemented by the Indonesian government also began to focus on character building, one of which is the character embodying environmental concern (Musanna et al., 2017). The concern will be developed if someone knows and understands their environment. It was aligned with the learning objectives of environmental geography courses (Biologi et al., 2013) in university.

Environmental geography is one of the required subjects in the Education of Geography programs. This subject teaches students to understand the geosphere phenomenon of environmental, spatial and territorial as the human interaction with the environment (Ridha et al., 2019). It also teaches students to analyse environmental problems and how to solve them. It focusses on environmental problems as a result of human interaction with the environment, environmental policies and sustainable development (Anand & Nagol, 2016; Yassin, 2020).

Problems encountered in daily life about environmental issues can be used as a lecture topic to be solved using the knowledge that has been obtained by students (Reyes-García et al., 2010) One learning model that meets the criteria is learning based on local culture (Eshariyani, Nyoman, Degeng, Pd, & Imron, 2019). The learning is perceived (1) to make



meaningful and contextual learning very closely related to cultural communities, where it is studied and will be applied late and with the cultural community which we are from; (2) to make learning interesting and fun. Learning conditions that allow the creation of contextual meaning was based on initial experience as a member of a cultural society (Osborne, 2013).

Based on the explanation above, the topic of this study was learning based on the glee tradition. This is because the glee tradition is the local wisdom of the Acehnese people to conserve the forest environment. Previous study on the glee tradition has not yet discussed the implementation of its value in the learning process and its effects on environmental knowledge and concern.

Science and technology, with COVID-19 nowadays, cannot be taught in the classroom, so it is necessary to design or integrate online learning in lectures. Online learning allows a learning experience with technology that offers accessibility, connectivity and interational flexibility in learning. Online learning provides opportunities to achieve new goals and roles to support the skills needed in the 21st century. Therefore, this article studied the learning based on the glee tradition integrated with online learning.

There are several aspects studied in this article, namely an explanation of the theoretical background, submission of hypotheses, explanation of research methods, data collection, characteristics of the subject and research instruments. Furthermore, the author also explained the environmental scope and limitations on research, as well as suggestions for future research.

Theoretical Background

Learning Model Based on the Glee Tradition Integrated with Online Learning

Local wisdom education is education that is based more on enhancing cultural values. This education teaches students always to be close to the concrete situations they face every day. The education model based on local wisdom is also an example that has significant relevance for life development skills, based on the empowerment and local potential in each region (Fritz-Vietta, Tahirindraza, & Stoll-Kleemann, 2017).

It also revealed that the activities conducted by students in the learning process would make students more enjoy learning. Students need to construct knowledge in their minds because knowledge cannot be separated into facts or other separated proportions, but reflects skills that can be applied (Hamid, Ijab, Sulaiman, Md. Anwar, & Norman, 2017).



The learning based on culture began with an experiential learning approach, which means learning through experiences. The experiential learning approach includes both the content and the process of "what is learned and how it is learned". The learning experience includes content and process, and in this case, learning is not just what is learned but how to learn it (Dieumegard, Nogry, Ollagnier-Beldame, & Perrin, 2019).

The association of experiential learning approaches with learning processes that use a culture-based approach was an appreciation of direct experience with those in the environment around which students' study (Cahn & Smoller, 2019). The culture-based learning brought a local culture that has not always been found in the curriculum into the learning process of various subjects in university.

Learning based on local wisdom will be good for developing students' skills in respecting the environment (Afrian, Hariadi, Akob, & Islami, 2020). By integrating and practising the values of glee tradition as done in customs and taboos, students will be close and care for their environment. It is following the opinion that the efficiency in using natural potential was also able to make them smart so that they would be concerned more about the environment and love the nature around them (Yardley et al., 2012; Sumarmi et al., 2020).

The learning material related to glee tradition would also increase the positive meaning upon students. In learning, it must be taught in the minds of children that humans are not just living, but also exist so that they are motivated to try to overcome limited situations. Learning material must have a high meaning and relevance to the empowerment of their lives in real terms, based on the reality they face (أبو et al., 2016).

Online learning is now becoming a trend in this COVID-19 pandemic as a way to prevent transmission of the virus. The application of online learning is correlated with the constructivist learning theory. Online learning in constructivist learning theory would make students into active learners, facilitate students to build their knowledge, encourage collaborative and cooperative learning, student interaction with content, other students and lecturers, and enable students to reflect and internalise the information they have acquired. Based on the explanation above, learning based on the glee tradition was very suitable to be integrated with online learning. The stage which is integrated with online learning adopts the experiential learning stage from Kolb (Kolb, 2015).

The Effect of Knowledge and Environmental Concern in Environmental Geography Subject

Knowledge is the result of "knowing" after someone uses the five senses in recognising an object (Cox, Ritchie, Fawns-Ritchie, Tucker-Drob, & Deary, 2019). After the process of



recognising or observing an object, the information received turns into knowledge through understanding, experience and intensity of attention to the object. Knowledge is the totality of thoughts, ideas, ideas about a particular thing, including the technical ability to solve problems related to it.

Knowledge about the environment is the basic knowledge possessed by individuals to help preserve the environment (Megantari, Purwati, & Anggoro, 2020). Environmental knowledge means knowledge and concern with environmental problems and their solutions. In general, the most important dimensions of each individual's environmental concern are environmental knowledge, values, willingness to act and actual behaviour that is influenced by several factors, including elements of intention and situation (Cegarra-Navarro et al, 2010; Kwan et al., 2019).

Furthermore, a person's knowledge or cognitive abilities are measured in 6 aspects, namely remembering, understanding, applying, analysing, evaluating and creating. This study measured students' environmental knowledge through 5 aspects, namely remembering, understanding, applying, analysing and evaluating (Gage, Ing, & David, 2001).

Environmental knowledge possessed by students is expected to create attitudes and behaviours directed to environmental concern. Environmental concern can be formed through self-habituation (Muharlisiani et al., 2019). Attitudes and behaviours can be developed through the stages of knowledge, implementation, and habits (Sternberg, 2004; Minds, 2015).

The environmental geography subject is one example of environmental education (Kamil, Utaya, Sumarmi, & Utomo, 2020). Environmental education is assumed to have a significant impact on environmental concern, daily lifestyle, and student behaviour. The results found a strong correlation between the intensity of environmental education and environmental knowledge of students. It is partly due to environmental education itself and partly due to higher intrinsic motivation from committed students who participate voluntarily in environmental education, especially at the university level (Kurniawan et al., 2019 ; Zhu et al., 2019).

Environmental education aims to develop people to become aware and care for their environment. Environmental education in Indonesia is one of the main focusses, especially in the 21st century, because it is a global issue nowadays, and also higher education aims to be able to produce students who are ready to live in their time (Corburn et al., 2019; Suhirman et al., 2020).

Constructivist understanding of learning related to the environment directs students to learn directly, learn from experience and learn continuously. Learning with a constructivist paradigm also means students learn through interaction, discussion and investigation of environmental problems (Freire & Branco, 2019). Therefore, it is an interesting subject to study the application of learning models based on local wisdom in the subject of environmental geography, and to see the effect on environmental knowledge and concern of students.

Research Model and Hypothesis

Environmental knowledge and environmental concern are essential characteristics for students participating in environmental preservation activities. Therefore, this study aims to know the effect between the learning model based on the glee tradition and the knowledge and environmental concern of geography students. The independent variable was the learning based on the glee tradition thought to influence the dependent variable, namely environmental knowledge and concern. Therefore, this study tried to express the following questions:

- How is the effect of learning based on the glee tradition integrated with online learning on students' environmental knowledge in higher education?
- How is the effect of learning based on the glee tradition integrated with online learning on students' environmental concern in higher education?
- How is the interaction of learning based on the glee tradition integrated with online learning towards students' environmental knowledge and environmental concern in higher education?

Method

Research Design

This study used a quasi-experimental design and nonequivalent control group design because the experiment was students, especially university students, so that several factors cannot be controlled or are inaccurate. Also, the selecting method was non-random sampling because the program already has classes that cannot be randomised as the research subjects, as seen in table 1.

Table 1: Nonequivalent Control Group Design

Subject	Initial Ability	Treatment	Final Ability
A	O1	X	O2
B	O3	-	O4



Description:

A = Experimental group

B = Control group

X = Learning based on glee tradition

- = Learning not based on glee tradition

O1 = Initial observation before treatment on the group of learning based on glee tradition integrated with online learning

O2 = Final observation after treatment on the group of learning based on glee tradition integrated with online learning

O3 = Initial observation on the group without being given the learning based on glee tradition (active learning)

O4 = Final observation on the group without being given the learning based on glee tradition (active learning)

The treatment in this study used learning based on glee tradition integrated with online learning (X) in the experimental group (A) and direct learning (-) in the control group (B). This study measured the knowledge and environmental concern of the experimental and control groups conducted through pretest and posttest. Before investigating the learning process, first was prepared a curriculum called the Semester Lecture Plan. After that, the lecturer leads the learning in the class. This study was carried out for three months, from February to May 2020.

Research Locations and Subjects

This study was conducted at the Samudra University, specifically in the Education of Geography study program. The subjects were students of 2018 who took environmental geography classes; a total of 2 classes which were divided into experimental group and control group. The experimental group was from unit 01 with 27 students, and the control group was from unit 02 with 25 students.

Research Instrument

This study used two instruments, namely tests and questionnaires, to see the effect of learning based on glee tradition integrated with online learning on students' environmental knowledge and concern. This study used questions from the indicator that aligned with cognitive knowledge to find out students' environmental knowledge, namely 1) remembering, 2) understanding, 3) applying, 4) analysing, and 5) evaluating. The test items consisted of 5 description questions that scored adjusted to the level of difficulty. Meanwhile, to determine the students' environmental concern, this study used a questionnaire instrument consisting of 15 items measured with the Likert scale of 1-5 (1 = strongly disagree, 5 =

strongly agree) [3]. The instrument was designed by two experts in environmental geography learning materials and language experts.

After compiling the research instrument, then it conducted an expert validation test aimed to have the right language and material fitness. The results showed that the instrument was good to be tested on research subjects after correcting some inputs on each instrument.

Before the instrument tested on the subjects, it is first tested to the outside group of subjects, which is the 2017 class year of 20 students who had taken the environmental geography class. The trial was conducted for one week, and then the results were used as the basis for conducting the validity and reliability of the instrument.

Table 2: The indicators, questions, validity and reliability of the environmental knowledge instruments

Indicators	No.	Questions	Validity	Reliability
Remembering	1	What environmental problems occur in the video you watched?	0.617	0.828
Understanding	2	What causes the environmental problems that occur? Describe.	0.763	
Applying	3	There are some environmental ethics that can be applied to solve these problems. Please write an example of application of environmental ethics to prevent this problem.	0.463	
Analysing	4	In your opinion, what will happen if the above problems are not resolved in the future? Describe using theoretical study.	0.817	
Evaluating	5	Human life cannot be separated from the environment. Environmental issues that occur today, with the rise of industry and development, are often ignoring the environment. What did you do as a geography education student in this era? Describe your solution.	0.909	

Based on the results on table 2, it appears that all the items are valid and reliable, so that it can be used for the study.

Table 3: Environmental concern questionnaire

Environmental Concern Questionnaire	Questions	Validity	Reliability
Student attitudes and actions to protect the environment	There are needs to a movement to be the green campus, car free day event, and biopore makings.	0.791	0.890
	Discuss environmental issues in conversation both orally and in writing.	0.788	
	Throw garbage in the bin based on its type.	0.751	
	Get used to picking up trash found in public places.	0.855	
	Do not buy and keep protected animals from forests, such as birds, snakes, monkeys, and others.	0.604	
Student attitudes and actions to maintain the environment	Reduce the use of paper and tissue.	0.497	
	Turn off the lights during the day and at night.	0.653	
	Use own shopping bags.	0.571	
	Burn some plastic waste in front of the house.	0.593	
	Use own container for food/lunch.	0.446	
Student attitudes and actions to utilise the environment	Use old paper to make notes.	0.730	
	Collect leaves and organic waste.	0.694	
	Water the plants around regularly.	0.496	
	Make crafts or media for learning from plastic waste.	0.548	
	Understand the 3R concept and socialise it.	0.551	

Similar to environmental knowledge instruments, the environmental concern questionnaire also met the validity and reliability so it can be used for the study showed on table 3.

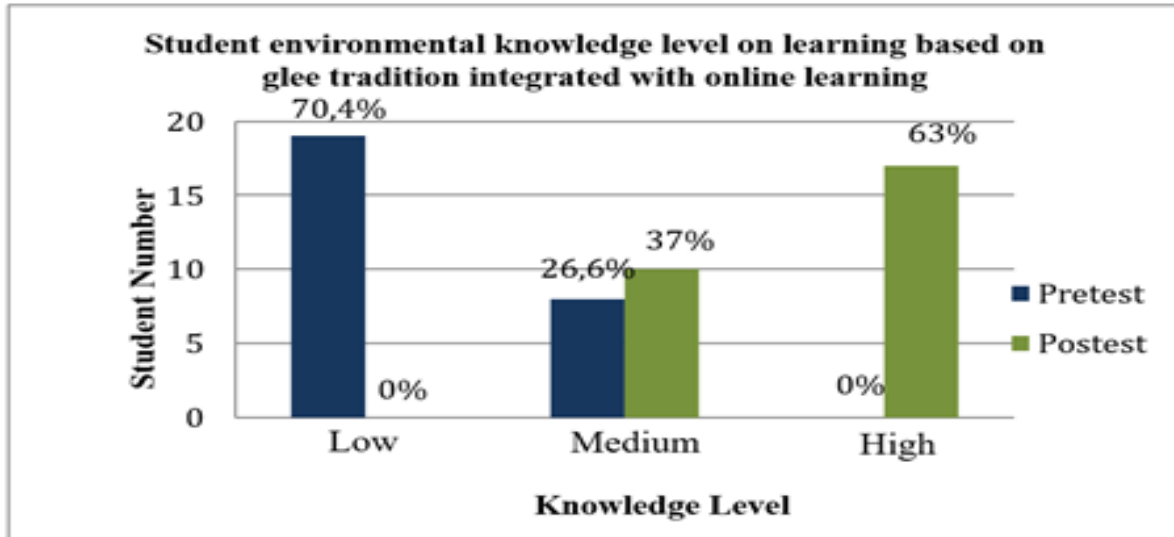
Data Analysis

This study used descriptive statistical analysis to measure environmental concern in students, t-test to see the effect of learning based on glee tradition on each dependent variable, and ANCOVA test to see which variable is most influential (Suhirman et al., 2020). Data analysis was processed with SPSS 23 for windows.

Results

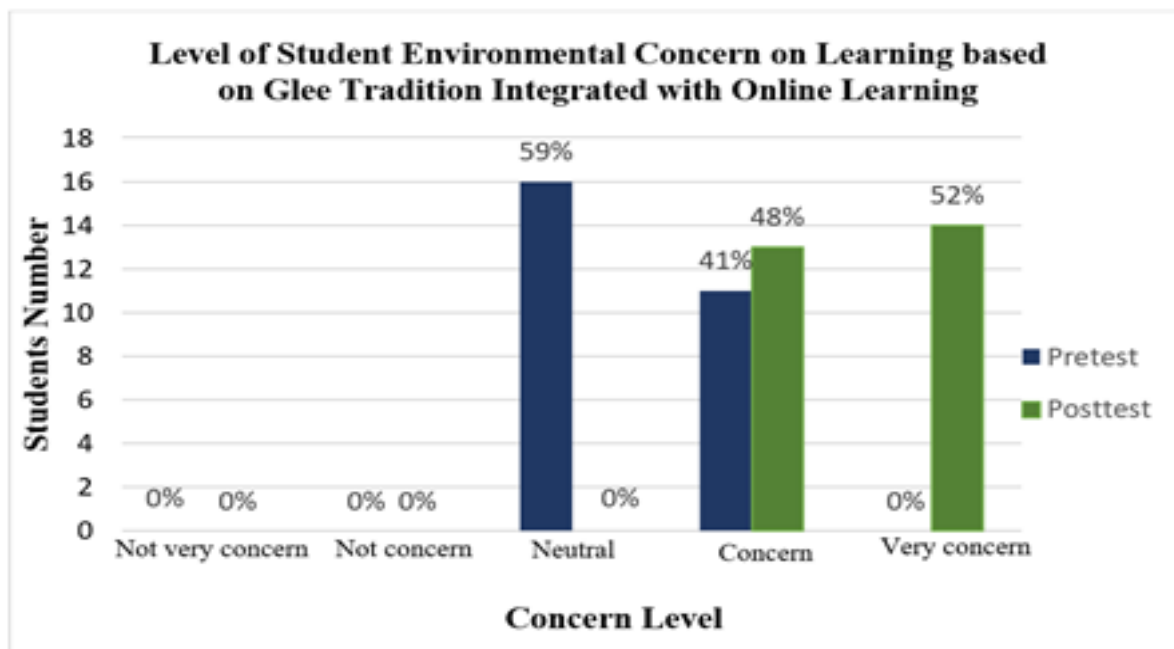
Pretest and Posttest Results of Experiment Group

Figure 1. Graph of student environmental knowledge with glee tradition-based learning



Based on figure 1, it can be seen that before being given treatment on learning based on glee tradition, there were 70.4% of students having low environmental knowledge, and no student with high knowledge. After treatment, students' environmental knowledge changed to 63% of students with high environmental knowledge; no student has low knowledge.

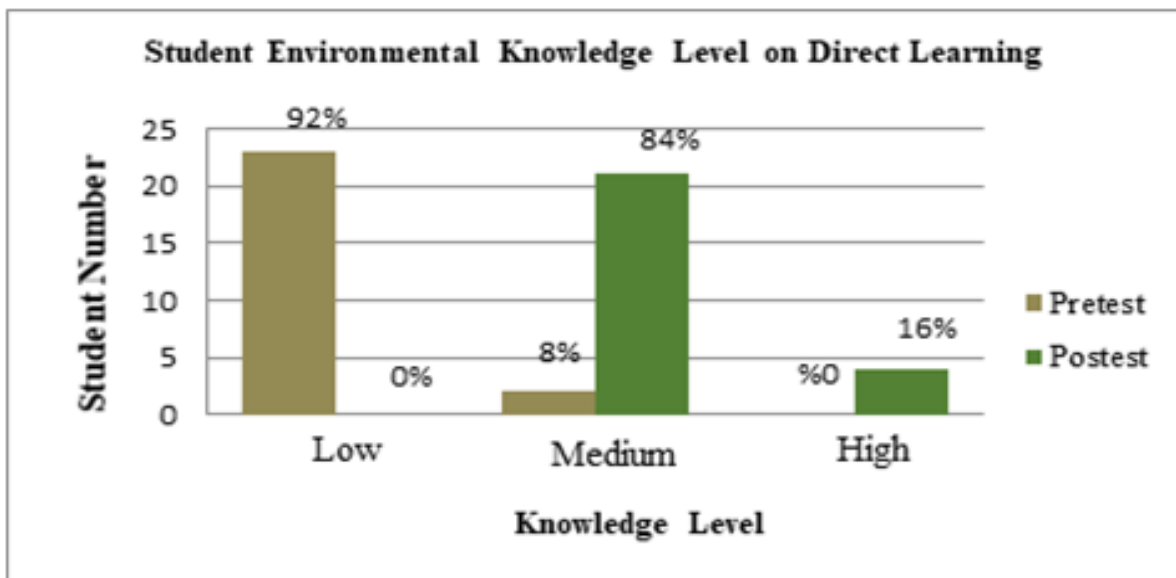
Figure 2. Graph Level of Student Environmental Concern on Glee Tradition Based Learning



Based on the figure 2, it was shown that before being treated for learning based on glee tradition, there were 59% of students in the neutral category. After being given treatment, there was a change in students' environmental concern – as many as 52% of students were very aware of the environment and 48% of students just aware of the environment.

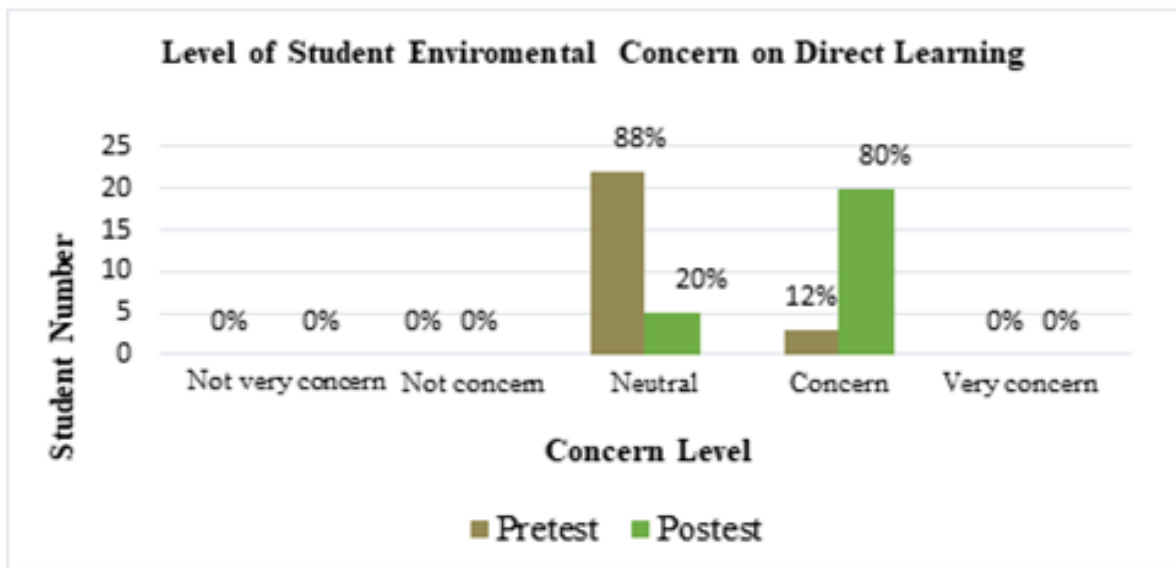
Pretest and Posttest of Control Group

Figure 3. Graph of student environmental knowledge with direct learning



Based on figure 3, it showed that there were changes before and after the treatment to direct learning. Previously, there were 92% of students who had low knowledge, but after direct learning, there were no students who had low knowledge. Furthermore, there are 84% of students who have moderate environmental knowledge.

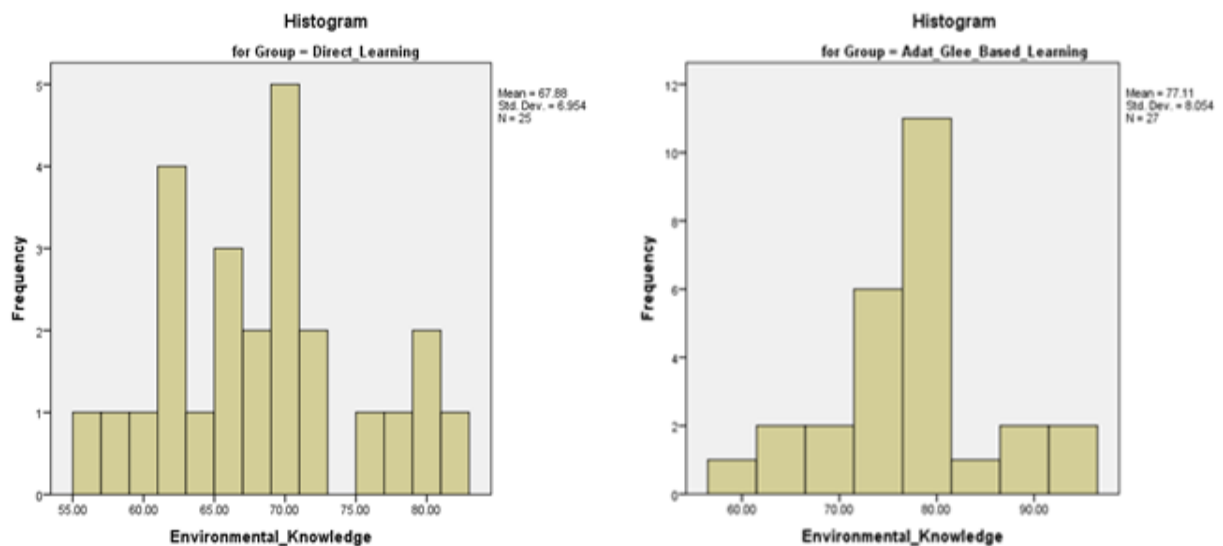
Figure 4. Graph of student environmental concern with direct learning



Based on figure 4, there is a change in student concern; 88% of students have a neutral concern before treatment and 80% of students have concern for the environment after treatment.

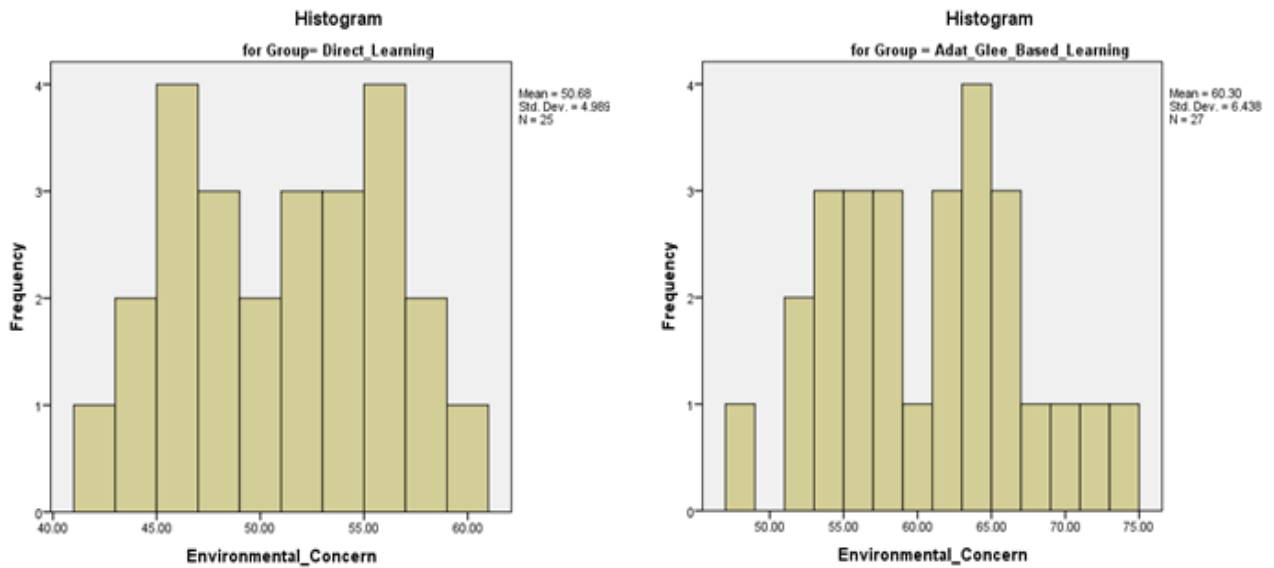
Normality test

Figure 5. Histogram of normality in student environmental knowledge



Based on the distribution of the bar charts on figure 5, the data of students' environmental knowledge were normally distributed so that assumptions were fit.

Figure 6. Histogram of normality in student environmental concern



Based on the distribution of the bar charts on figure 6, the data of students' environmental concern were normally distributed so that assumptions fitted.

Homogeneity Test

Table 4: Homogeneity of Research Data

Variables	Components	Levene Statistic	df1	df2	Sig.
Environmental knowledge	Based on Mean	0.061	1	50	0.806
	Based on Median	0.061	1	50	0.805
	Best on Median and with adjusted df	0.061	1	46.895	0.806
	Based on trimmed mean	0.059	1	50	0.809
Environmental concern	Based on Mean	1.621	1	50	0.209
	Based on Median	1.496	1	50	0.227
	Best on Median and with adjusted df	1.496	1	44.864	0.228
	Based on trimmed mean	1.628	1	50	0.208

Based on the homogeneity test results showed on table 4, it was found that the data on environmental knowledge and environmental concern had fulfilled the requirements as homogeneous data. It can be seen from the significance value based on mean was above 0.05.

T-test

Table 5: T-test result

Variable	Learning type	Mean	SD	Sig (2-tailed)
Environmental knowledge	Based on glee tradition	77.11	8.05	0.000
	Direct	67.88	6.95	0.000
Environmental concern	Based on glee tradition	60.29	6.44	0.000
	Direct	50.68	4.99	0.000

Based on the test results using SPSS, significant value was obtained. The learning based on glee tradition proved a significant result integrated with online learning and has influence to increase environmental concern and environmental knowledge. Learning based on glee tradition was better to increase environmental concern and environmental knowledge than direct learning, as shown on table 5.

ANCOVA test

Tabel 6: ANCOVA test result

Tests of Between-Subjects Effects					
Dependent Variable: Environmental Concern					
Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1907.704 ^a	2	953.852	48.297	.000
Intercept	200.858	1	200.858	10.170	.002
Environmental Concern	707.332	1	707.332	35.815	.000
Learning model	235.158	1	235.158	11.907	.001
Error	967.738	49	19.750		
Total	164049.000	52			
Corrected Total	2875.442	51			

a. R Squared = .663 (Adjusted R Squared = .650)

A There is an effect between learning based on glee tradition integrated with online learning into each variable, so then this study conducted further tests by conducting ANCOVA test to determine the effect of the three variables with knowledge as the covariate. The SPSS test results stated that environmental knowledge and learning both influence students' environmental concern. Also, the table above showed that environmental knowledge has a significance of 0.000, while the learning influences environmental concern with a significance value of 0.001. From the average value, it can be concluded that the application of learning will increase knowledge and will directly affect the level of students' environmental concern as shown on table 6.

Discussion

The results showed that the students' environmental knowledge and environmental concern using the learning based on glee tradition integrated with online and direct learning had a different significance. Learning based on glee tradition was proven to have higher results.

The learning based on *glee* tradition integrated with online learning has a high value on students' environmental knowledge and concern. Firstly, it was because students learn from concrete experience through videos on environmental damage in the area around them. Besides, students also experienced the local culture of *adat glee* directly. Knowledge gained from concrete experience can be long-lasting and meaningful, and also can influence students' attitudes and actions because they not only see or hear but play an important role in environmental preservation, so that applications in everyday life could be easier.

Secondly, students in groups were invited to discuss together environmental issues from various perspectives in learning based on glee tradition. Students did *duek pakat* (discussion) to discuss environmental issues. This discussion is not only about environmental conservation, but also the attitudes and actions that have been taken, whether it is destructive or not. The discussion helped students to find out the effects of their behaviour and whether it is right or wrong. It affected students' attitudes and behaviour, especially towards their environment (Kraft et al., 1995 ; Safari et al., 2018).

Thirdly, students were asked to explore their knowledge by providing creative ideas to preserve the environment through *duek pakat* (discussion) (Saadatmand & Kumpulainen, 2013). The ideas must be in line with the rules of the glee tradition. It is because learning based on culture can help students to construct their knowledge through interaction with the environment in a social context, things that have been owned, known and believed from the lesson that has been learned follow by the constructivist learning theory of Vygotsky and Piaget (Eysenck, 1988; Mayasari et al., 2016 ; Lechner et al., 2019).

Furthermore, at the experimentation stage, students were required to make decisions to overcome the existing problems, delivered the decisions in presentation and responded to other group presentations (Kraft et al., 1995; Kolb, 2015; Shelest et al., 2017). At this stage the lecturer also taught the value of the Glee tradition that students may not interrupt or take others' belongings; for this reason, the lecturer reminded them to not interrupt when another group makes a presentation.

Learning based on glee tradition integrated with online learning also influenced students' environmental knowledge and skills. This was because online learning required students to have independent learning. Independence was interpreted as perseverance and



resourcefulness so that students could find it easier to construct knowledge and eventually could form attitudes and behaviours that aligned with the research.

This research was aligned with previous research (Ruyadi, 2010 ; Boeve-de Pauw & Van Petegem, 2013 ; Lathifah & Wilujeng, 2016) which states that learning based on culture will affect students' knowledge and behaviour. In this study, learning based on glee tradition was influenced by knowledge and behaviour of environmental concern, and also aligned with research (Lado, 2004; Schorkowitz, 2012).

The results of the above also showed the interaction between environmental knowledge and environmental concern. Environmental knowledge influenced environmental concern because before a person behaves well or badly towards a phenomenon, they must first know about the phenomenon, then they will be aware and behave accordingly (Ham et al., 2015; 2016).

Additionally, the effect of environmental knowledge on environmental concern arising due to students' environmental concern was in the neutral category from the beginning, not in the category of not aware. By adding knowledge, it would be easier to influence the attitudes and behaviour of these students.

This study has several limitations in terms of research subjects and research variables. This study used only one study program at one University in Aceh, Indonesia, so it has not been able to represent all Indonesian students. Also, in variable limitations, this study only examined the knowledge until the evaluating level, not to the creating level based on Krahtlow taxonomy. All of these limitations will continue to be improved for future research. Limitations of this research were expected to be suggestions for further research.

Conclusion

The main objective of this research was to find out the effect of learning based on the glee tradition on students' environmental knowledge and concern. This study examined geography education students at Samudra University, Aceh. Current technological improvements were reversed with environmental quality, not only in Aceh, Indonesia, but throughout the world. Therefore, there was a need for research from the education area, especially higher education, to align the technological and scientific rises with environmental concern.

Research showed that there is an effect on each dependent variable. It showed that learning based on the glee tradition has the influence of increasing knowledge, which also increases students' concern for their environment. This significant effect occurred because learning based on glee tradition adopted from experiential learning has concrete experience levels, a



duek pakat when reflecting observations, abstract conceptualisation, and actively presenting the solutions offered. In this learning, students were involved directly and actively.

Another finding from this study was that knowledge has a more significant influence on environmental concern directly compared to learning based on glee tradition on concern. It was because attitudes and behaviour developed from knowledge. The higher a person's knowledge the more it will affect attitudes and behaviour, while concern is one form of attitude and behaviour that grows from knowledge.

Acknowledgments

The researcher would like to thank Malang State University for granting Dissertation research, as well as the Ministry of Technology and Higher Education Research for the BPPDN Scholarship.



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