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Study of Communicative and Collaborative Characteristics of Students using Inquiry Based Inquiry Based on Basic Acid Materials

Bella Listriani Putri* Maria Erna, Lenny Anwar

Chemistry Education Program Study, FKIP Universitas Riau, Pekanbaru, 28293, Indonesia

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ABSTRACT

Education today focuses on creating characters who are able to face future challenges. The first challenge in this global era is the need for every student to have process skills in 21st century learning known as 4C: (1) Communication Skills, (2) Collaboration skills, (3) Critical Thinking and (4) Creative. One of the characteristics desired in 21st century education is a communicative and collaborative character. The purpose of this study was to determine the improvement of the communicative and collaborative character of students after using guided inquiry-based e-LKPD on acid-base material. The form of this research was quasi-experimental research. The research sample consisted of 2 classes, namely the experimental class (XI MIA 1) and the control class (XI MIA 2). Based on the research, the results showed that the use of guided inquiry-based e-LKPD on acid-base material can improve the communicative and collaborative character of students through observation results with an average value in the experimental class, respectively, namely 89.25% and 85% with the high category compared the control class is 44.75% and 36.75% with the low category.

1. Introduction

Currently there has been a paradigm shift in learning. Learning is no longer interpreted as a process of transferring knowledge from teachers to students, but as an attempt by the teacher to help students by providing facilities and situations that support students so that they can construct concepts or understandings. The responsibility for learning lies with students, while the teacher is responsible for creating situations that encourage initiative, motivation, and responsibility of students to learn. In this case, the teacher functions more as a facilitator. Teachers must provide more opportunities for students to discuss and express their opinions or understandings (Hasnah, 2012).

* Corresponding author.

E-mail: bellalistriani_putri@yahoo.co.id

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Today's education focuses on creating characters who are able to face future challenges. The first challenge in this global era is the need for every student to have process skills in 21st century learning known as 4C: (1) Communication skills, (2) collaboration skills, (3) critical thinking skills, and (4) Creativity skills ". In addition to aiming to form the skills needed, chemistry learning also teaches character formation in students, which is the mandate of the 2013 Curriculum with its scientific approach. In the 2013 Curriculum, one of the aspects assessed is attitude, including: honesty, discipline, responsibility, tolerance, mutual cooperation, courtesy and courtesy and confidence. A person's attitude reflects the character he has (Annisatul, 2016).

One of the characters that must be fulfilled in 21st century education is a communicative character and a collaborative character. Active communication and collaboration between students and between students and teachers are essential to produce quality learning (Kartika et al., 2017).

Communicative character is the individual's ability to communicate clearly, using spoken, written and nonverbal language (Erdogan, 2019). The communicative character in learning emphasizes aspects of communication, interaction, and developing linguistic competence, as well as language skills (listening, reading, writing, and speaking) as learning objectives and recognizes that it has something to do with communication activities in everyday life. The communicative character in Indonesia emerged in 1980 due to dissatisfaction with several theories that only emphasize learning in theory, without paying attention to how to use language in everyday life (Agung et al., 2016).

Collaborative character is the activity of collaborating with others to achieve common goals. The ability of individuals to work together effectively and responsibly with different groups when communicating is called collaboration skills (Annisa et al., 2019). Collaborative character of students is based on mutual learning and sharing knowledge. Collaborative character does not promote a system of competition between students. Students who have the ability to help less capable students, and vice versa, students who feel less able to ask for help from capable students so as to create an atmosphere of mutual learning.

Collaborative learning is very necessary for the characteristics of cooperation, respect for other people's opinions, self-control, patience, and emotional intelligence that is hidden from students, because by having these characteristics it is expected that learning will be meaningful, fun and produce problem solving as expected et al., 2002). This can further help students in constructing their knowledge (Kartika et al., 2017).

The development of information and communication technology (ICT) in the 21st century has penetrated widely so that it can affect various areas of life, even it is not something foreign to the community. In this century, technology also plays the largest role, starting from education, economic, social, cultural and so on (Fitria, 2019).

In the field of education, especially information and communication technology (ICT), it has changed the way people learn, get various information and can interpret information (Ardianto et al., 2019). In applying this guided inquiry learning model students are given the opportunity to work on formulating problems, analyzing results and drawing conclusions independently, while in determining topics, questions and supporting materials, the teacher is only a facilitator (Alaniyah et al., 2019). This sophistication will have a significant impact in educating and educating the nation's life. In addition, the development of ICT encourages the creation of creative innovations, one example is the birth of the concept of electronic learning (e-learning). E-learning is defined as a teaching and learning process that uses electronic circuits to convey learning content, interaction or guidance. Apart from that, there is also a definition above that defines e-learning as a form of distance education conducted through the internet (Arsyad, 2006).

Based on interviews with several Chemistry teachers at Pekanbaru High School, most teachers still use conventional learning. Conventional learning is something that teachers usually do so far, such as lectures, discussions and assignments. When learning takes place, students tend to be passive and motivation to learn is very low. When learning activities in the classroom, the teacher looks dominant. Teachers rarely use teaching aids during learning. Learning is also interrupted because it is only focused on textbooks and practice questions.

Student Worksheets (LKPD) or commonly known as *Lembar Kerja Siswa* are a learning tool that plays an important role in learning. LKPD is a printed teaching material in the form of sheets containing summary material and instructions that must be implemented by students. In this case, the assignment is adjusted to the basic competencies that students must have.

The development of e-LKPD is carried out in order to guide students in finding, solving problems and building their own knowledge. One of the innovations that can be done is the development of Guided Inquiry-based e-LKPD. The guided inquiry-based approach consists of six stages, namely orientation, formulating problems, formulating hypotheses, collecting data, testing hypotheses, and drawing conclusions. Through guided inquiry-based e-LKPD, educators can directly direct the mindset of students while at the same time creating independence of students in learning, finding knowledge and activating students in learning.

Research on LKPD-based guided inquiry on thermochemical material has been conducted by Nurfidianty et al. (2015) at SMA Negeri 2 Surakarta and SMA Negeri 1 Cawas. The results showed that students responded positively to the use of guided inquiry based LKPD. Learning through guided inquiry-based LKPD provides experiences in learning. Students participate actively in facing learning so that it can generate motivation for students to learn. However, the purpose of this study was to improve the communicative and collaborative character of students on acid-base material.

2. Methodology

This type of research design was a quasi-experimental. This research was conducted in September 2019. The research site was conducted at SMAN 1 Sentajo Raya. The population in this study were students of class XI MIA at SMAN 1 Sentajo Raya even semester of the 2019/2020 school year.

The selection of the experimental class and the control class was done randomly. Data collection techniques in research were interviews and observation. The data analysis technique for students' observation sheets was measured using the Guttman scale, where this scale only has two intervals, namely "agree" and "disagree" or "yes" and "no". Positive answers are assigned a value of 1 and 0 for negative answers. The results of the observation sheet will be presented in percentage form.

The criteria for improving the communicative and collaborative character of students after using guided inquiry-based e-LKPD can be seen in Table 1.

Table 1. Criteria for the Percentage of Observation Sheets for Communicative and Collaborative Characters

No	Interval	Criteria
1	81-100 %	Very High
2	61-80 %	High
3	41-60 %	Enough
4	21-40 %	Less
5	0-20 %	Very Less

(Eko, 2012)

3. Results and Discussion

According to Setiawardhani (2013) e-LKPD is a work guide for students to make it easier for students to implement learning activities in electronic form which can be seen on Gadgets. E-LKPD is a means to assist and facilitate teaching and learning activities so that effective interactions will be formed between students and educators, so as to increase student activities in increasing learning achievement. LKPD is also one of the learning resources that can be developed by educators as facilitators in learning activities. LKPD that is compiled can be designed and developed in accordance with the conditions and situations of learning activities to be faced.

In this research, we used an existing LPKD to obtain the communicative characteristic of the student in the learning. An example of an acid-base e-LKPD based on guided inquiry that has been tested for its validity and practicality can be seen in Figure 1.



Figure 1. E-LKPD Acid-Base Based Guided Inquiry

Observation Data Analysis of Communicative Character

Observations were made in class XI MIA SMAN 1 Sentajo Raya during the learning process. The observation sheet is composed of 20 indicators that refer to the communicative character. Communicative observations were carried out in the experimental class (using guided inquiry-based e-LKPD) and the control class (without using e-LKPD). The results of these observations are based on observer observations by giving a check mark in the "Yes" column if the students in the group do aspects of the indicator, and in the "No" column if the students in the group do not aspects the indicators. The 4 observers were assigned the task of each observer to supervise 1 group of the 4 groups that were formed. The following are the observations of the experimental class and the control class.

Table 2. Observation Results for the Experimental Class and the Control Class

No	Class	P1	P2	P3	P4	Score Average (%)	Category
1.	Experiment	88%	88%	91%	90%	89,25%	Very High
2.	Control	45%	45%	44%	45%	44,75%	Enough

Based on Table 2, it can be seen that the average percentage of the experimental class observation results is 89.25% with the very high category and the control class is 44.75% in the sufficient category.

Based on Table 2 above, it shows that there is a difference in the communicative character of students between the experimental class (using guided inquiry-based e-LKPD) and the control class (without using guided inquiry-based e-LKPD). The experimental class has a higher percentage value than the control class. The

increase in communicative character in the experimental class is caused because in the learning process students use guided inquiry-based e-LKPD. The activity steps in e-LKPD encourage students to actively communicate to solve problems that exist in e-LKPD.

Data Analysis Observation of Student Collaborative Character

The student's communicative character observation sheet consists of 13 indicators. Observations were made by 4 observers consisting of 1 group 1 observer. Collaborative observations were carried out in the experimental class (using guided inquiry-based e-LKPD) and the control class (without using e-LKPD). Collaborative observation was carried out in the experimental class (using guided inquiry-based e-LKPD) and the control class (without using e-LKPD). The results of this observation are based on observer observations by giving a check mark in the "Yes" column if the students in the group do aspects of the indicator, and in the "No" column if the students in the group do not do aspects of the indicator. The 4 observers were assigned the task of each observer to supervise 1 group of the 4 groups that were formed. The following are the results of the observation of the experimental class and control class in Table 3.

Table 3. Results of Student Collaborative Observation Data Analysis

No	Class	P1	P2	P3	P4	Score Average (%)	Category
1.	Experiment	83%	83%	87%	87%	85%	Very High
2.	Control	33%	34%	39%	41%	36,75%	Less

Based on Table 3, it can be seen that the mean percentage of the experimental class observation results is 85% with the very high category and the control class is 36.75% with the poor category.

Based on Figure 4.21 above, it shows that there are differences in the collaborative character of students between the experimental class (using guided inquiry-based e-LKPD) and the control class (without using guided inquiry-based e-LKPD). The experimental class has a higher percentage value than the control class. The increase in communicative character in the experimental class is caused because in the learning process students use guided inquiry-based e-LKPD. The activity steps in e-LKPD encourage students to actively collaborate to solve problems that exist in e-LKPD.

4. Conclusion

The application of guided inquiry-based e-LKPD on acid-base material provides results that there is an increase in the communicative and collaborative character

of students in the experimental class with very high improvement criteria. The improvement of the communicative and collaborative character of students is because in the learning process students are trained to communicate and collaborate through guided inquiry activities contained in guided inquiry-based e-LKPD, so that through these activities they are able to improve the communicative and collaborative character of students.

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