

# EMPOWERING 21ST CENTURY SKILL IN DISTANCE LEARNING THROUGH ELECTROLYTE SOLUTION ASSIGNMENTS AT SMAN 2 CIKAMPEK

Abdul Rosid, Cahyasari Tresnaningsih

SMA Negeri 2 Cikampek, Karawang Regency

\*Corresponding author: [abdulrosid.duchie@gmail.com](mailto:abdulrosid.duchie@gmail.com) , [cahyasaritresna@gmail.com](mailto:cahyasaritresna@gmail.com)

**Abstract.** *The research aims to capture the ability and measure the collaboration index of students in conducting and presenting experimental results, involving 252 respondents using the case study method. The aspect of showing the ability to work effectively, being able to appreciate team differences has an index of 81.41% with a VERY STRONG interpretation, "taking responsibility together in collaborative work and appreciating contributions made by team members" has an index of 67.55% with an interpretation of S T RONG, "shows flexibility and is willing to accept other people's opinions in achieving goals" has an index of 79.8% with a STRONG interpretation .*

**Keywords:** *Distance learning, Learning from Home, assignment , collaboration*

## INTRODUCTION

Online learning is a global phenomenon that occurs almost in the world, not only in Indonesia. During the pandemic , almost all educational institutions, especially universities in China, carried out an unprecedented massive "migration" from face-to-face learning in the classroom to online learning [1].

Online learning in Indonesia has actually been implemented by several educators before the implementation of *social distancing* by the government. Online learning that is applied is more likely to be in the form of assignments via applications. Students are given tasks to complete then corrected by the teacher as a form of assessment and given comments as a form of evaluation [2] .

Online learning, which replaces the previous conventional learning, does not mean without bringing new problems to the world of education. The obstacles faced are not only limited to pedagogic abilities, but the creativity and skills of teachers in using technology, as well as technical obstacles faced by teachers and students for the smooth implementation of online learning [3] .

Online distance learning is able to foster independent learning [4] . Learning without direct guidance from the teacher makes students independently seek information about learning materials and assignments given to them.

Entering the competition in the 21st century, the cognitive abilities of students become a supporting aspect in the abilities possessed by a person . [5] said that the 21st century skills are meant for everyone to master the 4Cs which are the means to achieve success in life in society in the 21st century. The 4C skills are *Communication, Collaboration , Critical thinking and Problem Solving , and Creativity and Innovation skills* . 4C is a *soft skill* which in its daily implementation is much more useful than mastering hard skills .

Many researchers discuss the importance of teachers in instilling collaboration skills in the learning and learning process by providing critical instructions to students [6] .

In this study, the collaboration form and collaboration index of students during distance learning activities will be reported using the

practicum method on electrolyte and nonelectrolyte solutions .

## METHOD

### Research Subject

This research was conducted at SMA Negeri 2 Cikampek, located in Karawang Regency. This research was conducted in semester 2 of the 2020/2021 academic year from May to June 2021. The subjects of this research are students of class X MIPA – 1 to MIPA 6 with a total of 252 students

### Research Methods

This study aims to look more deeply into the forms of collaboration that occur to students during distance learning, so this research uses a *case study* . With this type of research, the researcher wants to study intensively the background and environmental interactions of the social units that are the subject with the research flow illustrated in Figure 1 [7] .

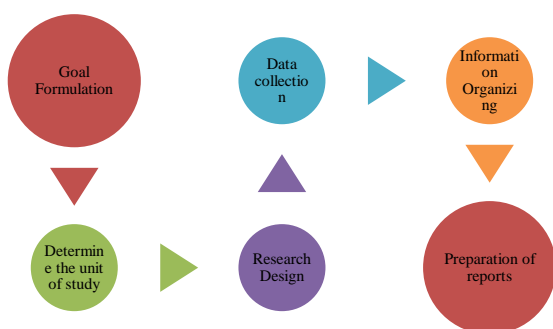


Figure 1. Research Flowchart

Because it was still in a pandemic, the experimental assignment entitled

Determination of Electrolyte and Nonelectrolyte Solutions was carried out by a group of students consisting of 4-5 people, based on the proximity of their domicile while still observing health protocols.

Assignments are only given once with a span of 14 days. The experiment was carried out in one of the students' house, all activities were documented in the form of photos or videos using a *handphone* (HP) as shown in Figure 2 and after the experiment was completed, it was followed by making a report in the form of a document (word or pdf) and a *powerpoint file* to be presented . online by all group members in their own places or houses.



Figure 2. Experimental Activities

Data was collected through a questionnaire conducted by filling out a survey via google form at the link <https://forms.gle/Jv1u2n5P6Ui5XGXGA> and each student's response/answer is given a score according to the statement using a Likert scale with references as shown in table 1 .

Table 1. Scoring for Student Responses to the Questionnaire

NO	Positive Statement		Negative Statement	
	Criteria	Score	Criteria	Score
1	Strongly Agree (SS)	4	Strongly Agree (SS)	1
2	Agree ( S )	3	Agree ( S )	2
3	Disagree (TS)	2	Disagree (TS)	3
4	Strongly Disagree (STS)	1	Strongly Disagree (STS)	4

Processing of student response scores is carried out by the following stages [ 8 ]

- Summing up the scores of all respondents on each statement item contained in the student response questionnaire.
- Calculating the percentage score of each statement item
- To do interpretation of the percentage of student responses

To state the interpretation of students' responses to the form of collaboration when conducting experiments at home, the percentage interpretation criteria are used as shown in table 2.

**Table 2 Interpretation Criteria**

No	Score range (%)	Criteria
1	81 – 100	Very strong
2	61 – 80	Strong
3	41 – 60	Enough
4	21 – 40	Weak
5	0 – 20	Very weak

## RESULTS AND DISCUSSION

Students are having the ability to collaborate if the student master these following things: 1) demonstrate the ability to work effectively and can appreciate team differences; 2) demonstrate flexibility and be willing to accept the opinions of others in achieving common goals; 3) being responsible for collaborative work and appreciate the contribution of each member [9].

In this study, collaboration aspects were measured through questionnaires to students, with categories of positive statements and negative statements for each desired collaboration topic. In detail described in table 3

**Table 3. Distribution of Collaborative Aspects Measured Through Survey**

No	Aspect	Statement	
		Positive	Negative
1	Demonstrate the ability to work effectively and be able to appreciate team differences	1, 2,3	4.5
2	Take responsibility for collaborative work and appreciate the	6, 7, 8, 9,11, 12	10

contribution of each team member			
3	Demonstrate flexibility and be willing to accept the opinions of others in achieving common goals	13, 17	14, 15, 16

Each aspect of collaboration that will be measured is outlined into several operational questions as described in table 4.

**Table 4. Interpretation of Scores for Collaborative Forms Each Question**

No	Question to	Index	Interpretation
1	Question 1	87.40%	Very strong
2	Question 2	91.70%	Very strong
3	Question 3	90.91%	Very strong
4	Question 4	86.76%	Very strong
5	Question 5	50.30%	Enough
6	Question 6	85.02%	Very strong
7	Question 7	70.06%	Strong
8	Question 8	48.72%	Enough
9	Question 9	36.07%	Weak
10	Question 10	83.50%	Very strong
11	Question 11	90.97%	Very strong
12	Question 12	58.50%	Enough
13	Question 13	62.75%	Strong
14	Question 14	81.55%	Very strong
15	Question 15	74.40%	Strong
16	Question 16	85.81%	Very strong
17	Question 17	94.47%	Very strong

While the average value of the interpretation index for each aspect of collaboration is presented in table 5

**Table 5. Average R Value Index - Interpretation of Collaborative Form Scores for Each Aspect**

No	Aspect	Index	Interpretation
1	Demonstrate the ability to work effectively and be able to appreciate team differences	81.41%	Very strong
2	Take responsibility for collaborative	67.55%	Strong

	work and appreciate the contribution of each team member		
3	Demonstrate flexibility and be willing to accept the opinions of others in achieving common goals	79.80%	Strong

Table 5 shows that "the aspect of showing the ability to work effectively and being able to appreciate team differences" has the largest index compared to other aspects, which is 81.41% with a VERY STRONG interpretation. This reflects that, the initial understanding and common perception to achieve common goals are the main foundation in the next collaboration process. Skills \_ collaboration that involves students in the dealing process or agreement to establish a critical decision to the success of the project [10].

Based on table 5 also, the aspect of " taking responsibility together in collaborative work and appreciating the contribution made by each team member" has an index of 67.55% with a **strong interpretation**. This indicates an awareness that the experimental activities carried out are collective activities, not individual work and each group member will be required to contribute and play a role in achieving the goals. Collaboration means a construction of shared understanding through interaction with other people, where the participants are committed or involved in a common goal and problem solving [11].

While the aspect of " showing flexibility and being willing to accept the opinions of others in achieving common goals" has an index of 79.8% with a **strong interpretation**. This can be interpreted as the awareness that every individual in the group has the same right to express their opinion in a democratic climate, no one is the most dominant in the group and every decision is a joint decision. In this aspect, it emphasizes the willingness of group members to accept various ideas and contributions from each member, whatever and in any form. Collaboration can be considered a measure of interaction between participants centered on sharing ideas, fostering creativity to work in

groups and influencing others, points of view during discussion [12]. So, no matter how small the contribution of ideas and other things is a form of collaboration.

## CONCLUSIONS AND SUGGESTIONS

Based on the results of data analysis, it can be seen that distance learning activities with practicum methods can build student collaboration in the aspect of showing the ability to work effectively and being able to appreciate team differences. in working collaboratively and appreciating the contributions that each team member makes with **strong interpretations**, aspects of showing flexibility and being willing to accept the opinions of others in achieving shared goals with **strong interpretations**.

For the next research, the relationship between collaboration skills with oral communication skills should be measured and increase the number of students to be measured or surveyed, by involving more schools or classes.

## REFERENCES

- [1] Bao, W. (2020). COVID-19 and Online Teaching in Higher education : a Case Study of Peking University. *Human Behavior and Emerging Technologies. Volumes 2*, 113-115.
- [2] Syarifudin, AS (2020). Implementation of Online Learning to Improve the Quality of Education as the Impact of the Implementation of Social Distancing. *Metalingua*, 31-34.
- [3] Mansyur, AR (2020). The Impact of COVID-19 on the Dynamics of Learning in Indonesia. *Education and Learning Journal. Vol 1, No. 2*, 113-123.
- [4] Firman, & Rahman, SR (2020). Online Learning in the Midst of the Covid-19 Pandemic. *Indonesian Journal of Educational Science (IJES). Vol 02, No. 02*, 81-89.
- [5] Zubaidah, S. (2016). 21st century skills: Skills taught through learning. *In the National Seminar on Education. (Vol. 2, No. 2)*, 1-7.
- [6] Helsdingen, A., van Gog, T., & van Merriënboer, J. (2011). The Effects of Practice Schedule and Critical Thinking Prompts on Learning and Transfer of a

- Complex Judgment Task. *Journal of Educational Psychology* , 1-17.
- [7] Nazir, M. (2014). *Research methods*. Bogor: Ghalia Indonesia.
- [8] R iduwan . (2016). *Statistical basics. 14th printing*. Bandung: Alfabeta.
- [9] Putri, AA, & Qosyim, A. (2021). Validity of 5M Scientific Learning Tool to Improve Collaboration Skills and Learning Outcomes of Middle School Students on Respiratory System Material. *Pensa E-Journal: Science Education. Vol. 9, No. 1* , 7-16.
- [10] Huang, D., Leon, S., Hodson, C., Torre, DL, Obregon, N., & Rivera, G. (2010). *Preparing Students for the 21st Century : Ezploring the Effect of Afterschool Participation on Students Collaboration Skills, Oral Communication Skills, and Self-Efficacy*. Los Angeles: National Center for Research on Evaluation, Standards and Student Testing.
- [11] Malmberg, J., Jarvela, S., Holappa, J., Haataja, E., Huang, X., & Siipo, A. (2018). Going beyond what is visible : What multichannel data can reveal about interaction in the context of collaborative learning ? *Computers in Human Behavior* , 235-245.
- [12] Dascalu, M., Trausan-Matu, S., McNamara, DS, & Dessus, P. (2015). ReaderBench : Automated evaluation of collaboration based on cohesion and dialogueism. *International Journal of Computer Support Collaboration Learn* , 395-423.