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The Impact of the Covid-19 Pandemic on Implementation of Chemistry Practicum: A Case of SMAN 2 Seunagan

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Abstract: Chemistry lessons that were previously conducted face-to-face must be changed to online methods during the covid-19 pandemic. This study aims to analyze the impact of the covid-19 pandemic on the implementation of chemistry practicum at SMAN 2 Seunagan. Data was collected using a questionnaire distributed to respondents. Data analysis was carried out using qualitative and quantitative descriptive techniques. This type of research is descriptive research with qualitative and quantitative approaches. The implementation of chemistry practicum refers to 3 components, namely: practicum support facilities, practicum activities and evaluation of practicum implementation. The population in this study were students with a sample of 36 people. The results showed that the implementation of chemistry practicum during the covid-19 pandemic was quite good, with a percentage of 38.9%. Thus, it can be concluded that the implementation of the chemistry practicum during the covid-19 pandemic has been running according to the goals and desired results.

Keywords: Covid-19 pandemic, chemistry practicum, high school student

Abstrak: *Pelajaran kimia yang sebelumnya dilakukan secara tatap muka harus diubah menjadi metode online di masa pandemi covid-19. Penelitian ini bertujuan untuk menganalisis dampak pandemi covid-19 terhadap pelaksanaan praktikum kimia di SMAN 2 Seunagan. Pengumpulan data dilakukan dengan menggunakan kuesioner yang dibagikan kepada responden. Analisis data dilakukan dengan menggunakan teknik deskriptif kualitatif dan kuantitatif. Jenis penelitian ini adalah penelitian deskriptif dengan pendekatan kualitatif dan kuantitatif. Pelaksanaan praktikum kimia mengacu pada 3 komponen yaitu: fasilitas penunjang praktikum, kegiatan praktikum dan evaluasi pelaksanaan praktikum. Populasi dalam penelitian ini adalah siswa dengan sampel sebanyak 36 orang. Hasil penelitian menunjukkan bahwa pelaksanaan praktikum kimia pada masa pandemi covid-19 cukup baik, dengan persentase 38,9%. Dengan demikian, dapat disimpulkan bahwa pelaksanaan praktikum kimia pada masa pandemi covid-19 telah berjalan sesuai tujuan dan hasil yang diinginkan.*

Kata kunci: *pandemi covid-19, praktikum kimia, siswa SMA.*

▪ INTRODUCTION

Based on the reality on the ground, the COVID-19 pandemic has had a negative impact on various aspects of people's lives, from the economic aspect to the educational aspect. The COVID-19 pandemic affects education systems around the world, so learning becomes ineffective and not optimal (Mustafidah & Azizah, 2022; Onyema, et al., 2020). This has forced the education system to shift from face-to-face to online (online) which is widely known to be fully online (Ong, et al., 2022). Indonesia is one of the countries that also uses an online during the COVID-19 pandemic. Educational institutions around the world have decided to use existing technical resources to create online (Adnan & Anwar, 2020).

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Over time online learning began to cause several obstacles, such as teachers who still did not understand technology so that the results obtained were not optimal (Hamid, et al., 2020; Sitepu, et al., 2022). Face-to-face learning during the COVID-19 pandemic can only be done in areas with green zone status, while distance learning is only carried out at schools located in yellow zones, orange zones or red zones. This is in accordance with the Instruction of the Governor of Aceh Number 11/INSTR/2020. SMAN 2 Seunagan is one of the schools located on Jl. Keude Linteung No. 79, Gampong Keude Linteung, East Seunagan District, Nagan Raya Regency, Aceh which has a green zone status. Based on these problems, SMAN 2 Seunagan carries out face-to-face learning (offline).

Practical learning that is still carried out offline applies a health protocol mechanism, namely the practicum is carried out by considering several aspects such as requiring students to use hand sanitizer, masks, gloves, laboratory coats and shoes (Sholikah, et al., 2020). Offline practicum is able to encourage students to be active and creative in experimenting with direct objects, using available facilities and infrastructure and practicing their ability to understand the tools and chemicals in the laboratory (Astuti, et al., 2021).

The health protocol model applied during COVID-19 can be used to curb the pandemic situation (Baloch, et al., 2020). The implementation of learning at SMAN 2 Seunagan is carried out offline during the covid-19 pandemic, by applying lecture and practicum methods. Practical learning carried out at SMAN 2 Seunagan during the COVID-19 pandemic implemented health protocols. This statement is in accordance with one of the decisions of the Minister of Education and Culture regarding the implementation of learning during the COVID-19 pandemic, which is carried out with limited face-to-face meetings while still implementing health protocols and distance learning (Permendikbud Number 384 of 2021). The implementation of health protocols is a shared responsibility in order to reduce the transmission rate of COVID-19 (Cardiah, et al., 2021).

Currently, Indonesia applies the 2013 Curriculum (K-13), which is a development of the previous curriculum. The learning applied in K-13 no longer depends on the teacher, but is student-centered (Suyatna, et al., 2020). Based on K-13 the characteristics of chemistry learning are not only limited to understanding theoretical lessons but can prove the concept of chemistry by doing practical activities. Through active involvement such as practicum, students can gain a lot of knowledge (Herlina, et al., 2022). One of the goals of chemistry in SMA/MA is to gain experience through experimental activities (Permendikbud No. 21 of 2016).

The implementation of practicum in chemistry learning aims to develop mastery of chemical concepts and can improve scientific skills. Suryaningsih (2017:52) suggests that there are four reasons about the importance of practical learning, namely: a) Practical learning generates learning motivation. b) Practical learning develops basic skills through practicum. c) Practicum becomes a vehicle for learning the scientific approach. d) Practicum can support the subject matter. That way, practical learning can support students' understanding of the subject matter. Similarly, Koki (2019)'s statement, which states that the purpose of the practicum is to equip students with conceptual and theoretical knowledge in understanding the nature of science.

SMAN 2 Seunagan School implemented several policies in the process of implementing learning during the covid-19 pandemic. These policies are in the form of lesson hours that are narrowed from before. The allocation of study time has decreased during the covid-19 pandemic when compared to the previous time (Turhan & Yakut, 2020). The allocation of lesson time before the covid-19 pandemic lasted for 40-45 minutes in one lesson hour, while during the covid-19 pandemic it only lasted for 30-35 minutes. Learning during the covid-19 pandemic has almost caused students to have difficulty in time management (Almanar, 2020). Every student and teacher always applies health protocols starting from entering the school yard until learning is complete. There are other learning systems that can be used by teaching staff as a medium for delivering knowledge, namely online and mixed (a combination of two methods, namely face-to-face and online) (Zhafira, et al., 2020). Online learning is a teaching and learning process that is carried out using the internet as a place to distribute knowledge. This form of learning can be done anytime and anywhere without having to be tied to time and without having to meet face to face (Syarifudin, 2020).

The government is aware of the increasing importance of online learning during this COVID-19 pandemic (Dhawan, 2020). The government's program to break the chain of the spread of COVID-19 can be realized, namely by implementing an online learning system (Khasanah, et al., 2020). Several schools in Aceh use the learning model as mentioned above. The selection of the learning model is determined based on the Covid-19 distribution zone. The grouping of the spread of covid-19 in Asia is divided into 4 zones with the number of active cases of covid-19 and the death rate, including 1) red zone (very high); 2) orange zone (high enough); 3) yellow zone (medium); and 4) blue zone (low) (Arminarahmah, et al., 2021). Based on the phenomena described above, the researchers conducted further research with the title "Analysis of the Impact of the Covid-19 Pandemic on the Implementation of Chemistry Practicum at SMAN 2 Seunagan"

▪ METHOD

Procedure The

A qualitative and quantitative approach are used in this research. The qualitative approach method is to obtain in-depth information directly from respondents through interviews and also observations of the respondent's condition (Aras, et al., 2019; Thambu, et al., 2021). By using qualitative and quantitative research approaches, it can produce understanding and findings about current events in the form of meaningful numbers. The type of research used is descriptive qualitative. Qualitative descriptive (QD) is focused on answering research questions related to who, what, where and how an event occurred so that it can finally be studied in depth in order to find patterns that arise in the event (Power, et al., 2022; Yuliani, 2002). 2018). Qualitative and quantitative approaches with descriptive research are used in this study to analyze the impact of the covid-19 pandemic on the implementation of chemistry practicum at SMAN 2 Seunagan.

Research Subjects Research

Subjects are the main informants in the research setting who can help provide information (Sundari, 2019). To get the right data with research, it is necessary to

determine the informants who have the competence and in accordance with the data needs. The subjects of this study were students in each science class at SMAN 2 Seunagan in odd semesters.

Research

Instruments This research instrument uses a questionnaire with a modified measuring instrument from the Likert scale. The Likert scale is a commonly used assessment format (Cheng et al., 2021). According to Widagdo, et al. (2020), the Likert is used to measure the attitudes, opinions and perceptions of a person or group regarding an event or social phenomenon. Measurements with a Likert scale have a level from positive to negative.uses Likert scale measurements with 5 answer options, namely strongly agree, agree, disagree, disagree, and strongly disagree. However, in this study, only 4 answer options were used, namely Strongly Agree = SS, Agree = S, Disagree = TS and Strongly Disagree = STS in order to avoid doubtful respondents' answers that lead to a middle value (neutral). Where the scoring used to assess each respondent's answer can be seen in Table 1.

Table 1. Scores of alternative answers

Alternative Answers	Statements	
	Positive	**Negative**
Strongly Agree (SS)	4	1
Agree (S)	3	2
Disagree (TS)	2	3
Strongly Disagree (STS)	1	4

(Source: Widagdo, et al., 2020)

The instrument indicators studied consisted of 3 components, namely: 1) supporting facilities components; 2) components of practicum activities; and 3) evaluation component of practicum implementation. There are 27 statement items in the questionnaire studied. Each component has a different number of statements, in the practicum supporting facility component there are 6 statements, the practicum activity component has 17 statements, and the practicum implementation evaluation component has 3 statements. The instrument used was developed from previous research.

Validity test is used in order to determine the level of feasibility or accuracy of each question/statement item in order to produce the desired data. Validity is the extent to which the evidence measured supports the proposed interpretation and use of the instrument score (Budhathoki, et al., 2022). Amanda, et al. (2019) revealed that the validity test is very important so that the questions/statements given do not produce data that deviates from the description of the variables in question. Reliability is very necessary before conducting research, namely to measure the level of accuracy, stability and accuracy of an instrument (Ayu & Rosli, 2020). Data collection techniques were carried out by observation, questionnaires and documentation.

Data Analysis Techniques Data

analysis techniques are methods of processing data into information. When conducting research, analyzing data is very necessary so that the data can be understood easily. This study uses statistical data analysis and the assessment criteria used to obtain the satisfaction score of the respondents towards the implementation of the practicum refers to Sudijono (2009:175) namely:

Table 2. assessment criteria for satifaction

Scoring	Criteria
X < M - 1.5 SD	Not good
M - 1.5 SD X < M - 0.5 SD	Not good
M - 0.5 SD X < M + 0.5 SD	Enough good
M + 0.5 SD X < M + 1.5 SD	Good
M + 1.5 SD X	Very good

(Source: Sudijono, 2009:175)

▪ RESULT AND DISSCUSSION

Before this research was conducted, the researcher conducted the validity first to one of the validators so that the questionnaire was declared valid. The validator for the validation of the questionnaire instrument for analyzing the impact of the COVID-19 pandemic on the implementation of the chemistry practicum at SMAN 2 Seunagan is an Education Lecturer from the Chemistry Department, he assesses that the statement content of the questionnaire instrument is in accordance with the aspects of the implementation of the chemistry learning practicum that will be researched in the field. Data from the analysis of the impact of the COVID-19 pandemic on the implementation of the chemistry practicum at SMAN 2 Seunagan was obtained through a questionnaire with 27 statements. After calculating the Mean (M) and Standard deviation (DS) of the total score of each respondent. The following are the results of the analysis of the impact of the COVID-19 pandemic on the implementation of the chemistry practicum at SMAN 2 Seunagan and the next discussion will be reviewed from every aspect.

Components of Practicum-Support Facilities

The analysis results of the components of practicum-support facilities from the impact variable of the covid-19 pandemic on the implementation of chemistry practicums obtained an average value (M) of 67 and a standard deviation (SD) of 7.4. The following are the results obtained are shown in Table 3.

Table 3 Frequency distribution of components of practicum supporting facilities

Scale Raw	Score Mature Value	Range of Score	Criteria	Frequency (f)	%
M - 1.5 Sd	56	X < M - 1.5 Sd	Not good	3	8.3
M - 1.5 Sd	56	M - 1.5 Sd X < M - 0.5 Sd	Poor	2	5.6
M - 0.5 To	63	M - 0.5 Sd X < M + 0.5 Sd	Fairly good	13	36.1
M + 0.5 To	71	M + 0.5 Sd X < M + 1.5 Sd	Good	7	19.4
M + 1.5 To	78	M + 1.5 Sd X	Very good	11	30.6
Total				**36**	**100**

When viewed from the results of data processing in the frequency distribution table for the components of practical support facilities above, student opinions tend to be marked by 8.3% in the bad category, 5.6% in the poor category, 36.1% in the good enough category, 19.4% in the good category, and 30.6 % is in the very good category. It can be seen from the results of data processing that the students' opinions are in a fairly good category, because this category has the highest percentage of 36.1%.

Components of Practicum Activity

The results of the analysis of the components of practicum support facilities from the impact of the Covid-19 pandemic on the implementation of chemistry practicums obtained an average value (M) of 69 and a standard deviation (SD) of 5.0. The following are the results obtained are shown in Table 4.

Table 4 Frequency distribution of practicum activity components

Scale Raw	Score Mature Value	Range of Score	Criteria	Frequency (f)	%
M - 1.5 Sd	62	X < M - 1.5 Sd	Not good	2	5.6
M - 1.5 Sd	62	M - 1.5 Sd X < M - 0.5 Sd	Poor	7	19.4
M - 0.5 To	67	M - 0.5 Sd X < M + 0.5 Sd	Fairly good	10	27.8
M + 0.5 To	72	M + 0.5 Sd X < M + 1.5 Sd	Good	17	47.2

M + 1.5 To	77	M + 1.5 Sd X	Very good	0	0
		Total		**36**	**100**

Based on results contained in the frequency distribution table of the practicum activity components above, the tendency of student opinions is marked by 5.6% in the bad category, 19.4% in the poor category, 27.8% in the good enough category, 47.2% in the good category, and 0% in the good category. very good. It can be seen from the results of data processing that the students' opinions are in the good category, because this category has the highest percentage of 47.2%.

Evaluation Components of Practicum Implementation

The results of the analysis of components of practicum support facilities from the impact of the COVID-19 pandemic on the implementation of chemistry practicums obtained an average value (M) of 69 and a standard deviation (SD) of 6.7. The following are the results obtained are shown in Table 5.

Table 5 Frequency distribution of evaluation components of practicum implementation

Scale Raw	Score Mature Value	Range of Score	Criteria	Frequency (f)	%
M - 1.5 to	59	X < M - 1.5	to Not good	5	13.9
M - 1.5 Sd	59	M - 1.5 Sd X < M - 0.5 Sd	Poor	4	11.1
M - 0.5 To	66	M - 0.5 Sd X < M + 0.5 Sd	Fairly good	14	38.9
M + 0.5 To	72	M + 0.5 Sd X < M + 1.5 Sd	Good	12	33.3
M + 1.5 To	79	M + 1.5 Sd X	Very good	1	2.8
		Total		**36**	**100**

Views From the results of data processing contained in the frequency distribution table for the evaluation component of the practicum implementation above, student opinions tend to be marked by 13.9% in the bad category, 11.1% in the poor category, 38.9% in the good enough category, 33.3% in the good category, and 2.8% are in the very good category. It can be seen from the results of data processing that the students' opinions are in a fairly good category, because this category has the highest percentage of 38.9%.

The Impact of the Covid-19 Pandemic on the Implementation of Chemistry Practicum

Data analysis of the impact of the covid-19 pandemic on the implementation of the chemistry practicum was obtained through a questionnaire distributed totaling 27 statements with a total of 36 students as respondents. After calculating the Mean (M) and Standard Deviation (SD) of the total score of each respondent, the following is the result of the analysis of the trend of the impact of the COVID-19 pandemic on the overall implementation of the chemistry practicum. For the average value (Mean) of the total score of each student is 69 with a standard deviation (SD) of 4.5. Furthermore, the data is obtained as shown in Table 6.

Table 6. Frequency distribution of the impact analysis of the covid-19 pandemic on the implementation of chemistry practicum

Raw Score Scale	Mature	Score Range	Criteria	Frequency (f)	%
M - 1.5 to	62	X < M - 1 ,5 Sd	Not good	1	2.8
M - 1.5 Sd	62	M - 1.5 Sd X < M - 0.5 Sd	Not good	2	5.6
M - 0.5 Sd	67	M - 0.5 Sd X < M + 0.5 Sd	Fairly good	14	38.9
M + 0.5 Sd	71	M + 0.5 Sd X < M + 1.5 Sd	Good	10	27.8
M + 1.5 Sd	76	M + 1.5 Sd X	Very good	9	25
		Total		**36**	**100**

Based on the results of data processing in the frequency distribution table, the analysis of the impact of the covid-19 pandemic on the implementation of the chemistry practicum obtained a percentage of 2.8% in the bad category, 5.6% in the poor category, 38.9% in the good enough category, 27.8 % in the good category and 25% in the very good category. The results of previous research conducted by Wicaksono (2022), also showed that online chemistry practicum learning resulted in the lack of skills of students in using chemical tools and materials in the laboratory. Online learning is only a medium for giving assignments remotely by teachers without any feedback and interaction with students (Maulana, 2021). Unlike the case with chemistry practicum learning which is carried out offline by applying health protocols.

In general, it can be seen from the results of data processing above, it is known that the description of the impact of the covid-19 pandemic on the implementation of chemistry practicums is generally in the pretty good category, because the good enough category has a large percentage of 38.9%. Thus, the results of the trend value are taken to be used as research conclusions that prove that the analysis of the impact of the covid-19 pandemic on the implementation of the chemistry practicum is in the good enough category, which means that most students who are positioned as research

objects / samples have a fairly good opinion on the implementation of the practicum. already underway.

▪ CONCLUSION

Based on the results of the data analysis that has been carried out in the previous section, the conclusion of the study is that the trend of analyzing the impact of the covid-19 pandemic on the implementation of chemistry labs is in the fairly good category with a percentage of 38.9%. Thus, the trend value is taken to be the conclusion of the study which shows that the analysis of the impact of the covid-19 pandemic on the implementation of the chemistry practicum is quite good. Analysis of the impact of the covid-19 pandemic on the implementation of the chemistry practicum in terms of each component of the practicum implementation produces the following results: 1) Components of practicum support facilities, 2) Components of practicum activities, 3) Components of evaluating practicum implementation are in a fairly good category.

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