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Development of Student Worksheets with Guided Inquiry Oriented on Reaction Rate Materials to Improve the Ability of Scientific Literacy of Pharmaceutical Vocational Students

S. Zahrah[1*], M. Mitarlis[2]
[1,2]Study Program of Chemistry Education, Faculty of Mathematics and Natural Sciences, Universitas Negeri Surabaya
Corresponding Author. Email: mitarlis@unesa.ac.id

Keywords

Student worksheet,
Guided inquiry,
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Abstract

The study intended to describe the feasibility of student worksheets with guided inquiry-oriented reaction rate materials to improve the ability of scientific literacy of pharmaceutical vocational students. Development research methods used 4D methods defining, designing, developing, and disseminating with limited only to the developing stage. The limited test was conducted on 22 students of class XI Pharmacy Vocational High School Bina Husada Pamekasan. Instruments consisted of study sheets, validation sheets, response questionnaires and observation sheets of learner activity, and pretest post-test sheets. The results showed that the feasibility of the student worksheet developed, which was feasible for use, including the validity of the student worksheet in terms of aspects of content, presentation, language, and graphics, obtaining consecutive percentages of 78%, 78%, 90%, and 93% with valid / very valid categories. The practicality of the developed student worksheets was practically used by reviewing the results of student responses of 98% and the results of observation of student activities by 93% with very practical categories. The effectiveness of the developed student worksheets was effective by assessing after the learning obtained a percentage of 100% with the complete category and an average N-gain score of 0.73 with a high category. Hence, the developed student worksheet with Guided Inquiry Oriented on Reaction Rate Materials to Improve the Ability of Scientific Literacy of Pharmaceutical Vocational Students was feasible to be used as a learning device.

INTRODUCTION

Education is a business that has an important role in developing the potential of individuals to be able to be independent in their lives. In education, the individual is given the ability to develop his potential. National Education according to the Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System that national education based on Pancasila and the Constitution of the Republic of Indonesia of 1945 (Article 2), serves to develop abilities and form the character and civilization of a dignified nation to educate the life of the nation, aiming to develop the potential of students to become human beings who believe and obey God Almighty, Noble, healthy, knowledgeable, capable, creative, independent, and become a democratic and responsible citizen (Article 3) (Permendikbud, 2016).

Vocational High School is a formal education school equivalent to senior high school Education. It provides special or additional education in the form of vocational programs. The educational curriculum includes productive, normative, and adaptive learning. Productive learning is a vocational subject on a program of expertise that students are interested in. While normative and adaptive learning is non-vocational learning. The hours of lessons on normative and adaptive learning are fewer than productive learning. The limitations of normative and adaptive lesson hours need to be optimized properly to support students' ability in the productive subject matter. Also, the lesson needs to be delivered interestingly so that the learners can master the material completely, especially in subjects that contain a lot of theory, numbers, and calculations, such as chemistry.

Vocational chemistry subjects are adaptive subjects with 4 hours of lessons in one week. Chemistry is a branch of natural science that studies matter and its changes (Chang, 2005). Most learners consider chemistry subjects to be one of the most

elusive subjects. Teachers need to prepare two types of learner knowledge before conducting experiments. First, declarative (cognitive) knowledge refers to the concept of conducting an investigation. Second, procedural knowledge refers to the skills and processes of scientific inquiry (Poon C.-L, Lee, Tan, & Lim, 2012).

Based on pre-research results, teachers use whiteboard media to explain materials and use learning resources from a worksheet in classroom learning. Here, the learning atmosphere tends to be passive. Learners have not been able to master the material well. In the reaction rate material, students should be presented with phenomena and problems, and conduct practicums to test the concepts and theories of factors that affect the reaction rate, aiming to attract the students' interest to learning. Some problems that hinder the learning process can be caused by methods used, such as lecture methods, so that learning does not motivate students' abilities. In addition, teachers provide many tasks without good facilities to students. These problems can be overcome by using a learning model that can involve students in the learning process. One of the learning models is the guided inquiry model (Nurdyansyah & Wahyuni, 2016).

The inquiry learning model has a very dominant and learner-oriented role in the learning process. The results of the study of (Blanchard, et al., 2010) found that learners who received learning through guided inquiry-based laboratory experiments tended to have higher score across different types of knowledge. The inquiry learning model involves the maximum ability of learners to think systematically, logically, and critically. that the output, students can formulate their findings with confidence (Trianto, 2007).

The inquiry learning model is suitable to be applied in learning about concepts and principles that are fundamental in certain fields of science. The inquiry model can directly affect the domain of science literacy and can improve the science literacy of learners, reviewed from the increase in N-Gain scores. Science literacy ability is closely related to meaningful learning (Holbrook J. & Raniikkmae M., 2009).

Teaching materials may use student worksheets in the learning process. Student worksheets can facilitate the process of implementing learning by the methods and materials used by teachers to students in conducting learning in the classroom. Student worksheets used in the process of learning in schools are irrelevant because it is limited in the form of the worksheet that is marketed freely. The teaching materials that are compiled and designed by several publishers in the markets contains summaries of subject matter, formulas that have not been presented interestingly, and less varied exercise questions and without phenomena related to the material in everyday life. As the result, learners are less active and no students' interest and difficult to give feedback from the available questions on the worksheets to provide strengthening concepts to students (Yuliandriati, 2019).

In a guided inquiry-oriented student worksheet, some of the materials that can be delivered include thermochemistry, reaction rate, chemical equilibrium, alkaline acids, colloids, colliquative properties, and others (Annafy. et al, 2015). The material that can be selected in the student worksheet is guided by the guided inquiry in this study, namely the reaction rate material because the reaction rate is one of the materials that have a fairly broad discussion and requires analytical skills. Thus, it affects the interest of learners in the learning process. Vocational students also need analytical thinking skills with mastery of science literacy.

The reaction rate is also one of the materials in chemistry studied by students of class XI Vocational high school department of Pharmaceutical Chemistry and selected as material in this study. The reaction rate material is associated with the rapid slow occurrence of a chemical reaction and reaction mechanism. Therefore, there is a need for supporting media, such as student worksheets so that students can know phenomena related to reaction rate material in everyday life. The student worksheet can make it easier for teachers to direct students to find concepts through experiments or investigations either alone or in groups (Foley, Mcphee, & Consulting, 2008)

Based on the background, the study aimed to describe the feasibility of the developed student worksheet, including the validity of the student worksheet in terms of aspects of content, presentation, language, and graphics. The practicality of student worksheet was reviewed from the results of students' responses and observations of student activities. The effectiveness of student worksheet was in terms of learning completion results and N-gain scores.

METHOD

The study methods used 4D improvement strategies, which consisyed of define, design, develop, and disseminate. However, most effectively finished till the improvement stage. This look become carried out in a restrained trial to discover the feasibility, practicality, and effectiveness of worksheets in generating first-rate coaching materials.

The student worksheets trial was held at Vocational High School Bina Husada Pamekasan class XI Pharmacy to 22 students on even semester of the school year 2021/2022 on February 2-12,

2022. Research devices used to consist of taking a look at sheets, validation, pretest and post-test, response questionnaires, and observation sheets of learner activity. The research phase was presented in Figure 1.

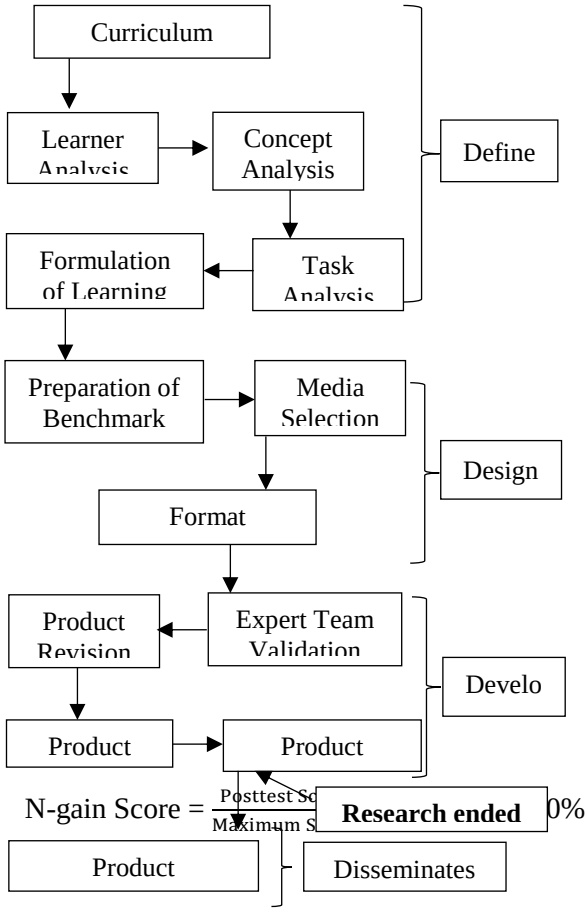

Figure 1. Stages of 4D Development Methods (Sutarti & Irawan, 2017)

Analysis of Study and Validation Sheet Results

The validation results of each compound in the validation sheet were analyzed using the Likert scale as in Table 1.

Table 1. Likert Scale

Value	Valuation
5	Excellent
4	Good
3	Good enough
2	not good enough
1	bad

(Riduwan, 2015)

Based on the consequences of the validation records, then it calculated a percent of the records the use of the subsequent formula.

$$\% \text{ Activity} = \frac{\text{Number of students who do}}{\text{The total number of students}} \times 100\%$$

Description:

Criteria score = Maximum score x Number of aspects rated x Number of respondents

Then, the percentage result was interpreted into the criteria score in Table 2.

Table 2. Interpretation Criteria

Percentage (%)	Category
81-100	Very valid
61-80	Valid
41-60	Valid enough
21-40	Less valid
0-20	Invalid

(Riduwan, 2015)

Validation analysis results were used as feasibility assessments. Student worksheets were stated to be legitimate and worthy of use to gain knowledge of the medium if the share of fulfillment was ≥ 61%.

Analysis of Student Response Questionnaire Results

The consequences of the learner reaction questionnaire were analyzed using the Guttman scale as in Table 3.

Table 3. Guttman Scale

Response	Score
Yes	1
No	0

(Riduwan, 2015)

Based on the outcomes of the reaction questionnaire records, then it calculated the share of the records using the subsequent formula. After that, the percentage result was interpreted into the criteria score in Table 4.

Table 4. Learner Response Score Interpretation Criteria

Percentage (%)	Category
81-100	Very practical
61-80	Practical
41-60	Quite practical
21-40	less practical
0-20	impractical

(Riduwan, 2015)

The outcomes of the student's reaction evaluation used as an evaluation of practicality. Students' worksheets were practical used as a learning medium if the percentage of achievement was ≥ 61%.

Analysis of Student Activity Observation Results

The consequences of the learner's response questionnaire were analyzed and calculated the percentage of the student's activity data using the following formula.

$$\text{Percentage } \% = \frac{\text{Number of result scores}}{\text{Criteria score}} \times 100\%$$

The percentage results used as supporting data for student response questionnaires. A student worksheet was supporting the response of students if the proportion of applicable students was extra than beside the point.

Classical Completeness

Classical completion was analyzed and calculated from individual completion data with a value above the minimum completion criteria of 75. Classical completion can be calculated using the following formula.

$$\%\text{Classical} = \frac{\text{Number of completed students}}{\text{Total number of students}} \times 100\%$$

The Ministry of Education and Culture (2014) stated that classical completeness obtained a minimum score of 85% (Permendikbud, 2014).

Improved Science Literacy Skills

The technology literacy capacity takes a look at ambitions to decide the development of students' technology literacy and learning completion results as a support for the effectiveness of student worksheets. The test of science literacy ability can be analyzed through classical completion. Based on the results of the pretest and posttest scores obtained by students, then it analyzed and calculated N-gain scores from the data using the following formula. The results of the N-gain score were interpreted into the criteria score in Table 5.

Table 5. N-gain Score Level Criteria

N-gain Score	Category
$g \geq 0,7$	High
$0,3 \leq g < 0,7$	Medium
$G < 0,3$	Low

(Hake, 1998)

Science literacy abilities were stated to be efficiently educated if the N-gain rating was acquired via way of means of students ≥ 0,3 with medium or excessive criteria. The outcomes of learners' N-gain rankings were used as effectiveness assessments. Student Worksheet was stated to be powerful a gaining knowledge of medium if the N-gain rating was ≥ 0,3.

RESULTS AND DISCUSSION

The results of the research entitled "Development of Guided-inquiry Student Worksheets on Reaction Rate to Improve Scientific Literacy of Pharmaceutical Vocational Students" obtained the following results: define, design, develop in the form of student worksheet validity results, student response, and activity results, and student science literacy ability test results.

Define Stage

The defining level includes steps, particularly curriculum analysis, student analysis, idea analysis, venture analysis, and system of studying desires finished on the defining level. This defining stage has the objective of establishing and defining the requirements for the preparation of student worksheets. At this stage, analysis activities were carried out according to the needs, including front-end analysis, student analysis, task analysis, concept analysis, and indicator specifications.The main objectives of formulated learning are: focusing attention and explaining the inquiry process, presenting inquiry problems and phenomena, formulating hypotheses to explain problems or phenomena, collecting data to test hypotheses, formulating explanations or conclusions, and reflecting on problem situations and thinking processes (Arends, 2012).

$$\text{Percentage}\% = \frac{\text{Number of result scores}}{\text{Maximum number of scores}} \times 100\%$$

Design Stage

At the starting stage, it produced the preliminary plan of the student worksheet. The student's worksheet advanced contain four components designed every containing 1 element that impacts the response rate. The mastering degrees in the student's worksheet alter the degrees of guided inquiry and there are also additives to educate technology literacy. Figure 2 was a display of the developed student worksheet.

Figure 2. (a) Main cover display and (b) Sub cover display on the student worksheet

The main cover contains 4 images, each of which presents 4 reaction rate factors. First concentration is depicted through the reaction of vitamins C and iodine. Second, the surface area is represented by the reaction image of effervescent tablets. Third, the temperature is described fire to heat water. And, the catalyst described is the reaction between hydrogen peroxide solution and potassium permanganate solids. While the cover of the subtitle focuses on one of the reaction rate factors.

Examples of student worksheet displays on the aspect of competency domain literacy were presented in Figure 3.

Figure 3. Examples of Student Worksheet Display on Aspects of Competency Domain Science Literacy

Figure 3 demonstrate the domain of competence in the aspect of science literacy, so that students can practice practicum to achieve competencies as formulated in basic competencies 3.3. Analyzing Factors that affect reaction rate (Permendikbud, 2016).

The experience of practicum activities of learners can collect data obtained by observation and experimentation, leading to clear hypotheses so that it is possible to predict a phenomenon that can be tested with scientific literacy learners have an understanding of producing knowledge that follows the right procedures and produces the right conclusions.

In the student worksheet display example, Figure 3 for students of vocational high school department Pharmacy experimental content is adjusted to the needs of mastering science literacy. For example, related to the material of factors that affect the reaction rate on concentration factors, especially related to the pharmacy about drug doses or vitamins through presentations about the effect of drug or vitamin concentrations/doses with related content was expected to increase students' mastery of science literacy, especially students of pharmacy vocational schools.

Develop Stage

In the improvement degree, its objectives were to supply products, particularly coaching substances in the shape of student worksheets which have been demonstrated technique so that they have long passed thru enhancements primarily based totally on the recommendation of reviewers and validators. The technique achieved to this degree was an evaluation technique, validation observed with the aid of using enhancements, after which the revised worksheet was used for constrained trials. The description of the technique achieved in the improvement degree is as follows.

Student Worksheet Eligibility

The feasibility of the advanced student worksheet ambitions was to recognize that the student worksheet is possible for use in getting to know reviewed from the effects of the observation and proven through experts.

Analysis of Study and Validation Sheet Results

Student worksheet review used to obtain advice or comments from one supervisor. The outcomes acquired via way of means of the student worksheet already encompass all additives of the

assessment, specifically content, presentation, language, and graphicness.

The validity of student worksheets was executed for the development of student worksheets advanced primarily based totally on hints which have been recommended and advanced primarily based totally on professional advice. The validity of the student worksheet advanced is reviewed from the validity of the content, presentation, language, and graphicness. The student worksheet was revised according to the advice. Then, the revised student worksheet was used for limited trials. The results of the validation was presented in Table 6.

Table 6. Validation Results

Assessed Criteria	Percentage	Category
Content	78%	Valid
Presentation	78%	Valid
Language	90%	Very Valid
graphicness	93%	Very Valid

Table 6 showed the validation results. The criteria for the content of the developed student worksheet obtained a percentage value of 78% in the valid category because the percentage obtained ≥ 61% (Riduwan, 2015). This indicates that the advanced student worksheet has met the nullity standards overlaying numerous aspects. The first thing of conformity of student worksheet content material obtained a percentage of 77% in the legitimate class. This means that the student worksheet advanced with the aid of using the response fee cloth with the 2013 curriculum, middle competencies, fundamental competencies, mastering indicators and mastering objectives. The second factor of the conformity of the contents of the student worksheet with the guided inquiry gaining knowledge of version obtained a percentage of 83% in the class may be very legitimate because of this that the student worksheet evolved has been with the aid of using the ranges of the guided inquiry gaining knowledge of version used together with staring at phenomena, formulating problems, proposing hypotheses, collecting data, and formulating explanations and conclusions. The third aspect of conformity of student worksheet content with the science literacy domain obtained a percentage of 73% in the legitimate class. This means that the student worksheet developed contained a science literacy domain including the domain of context, competence, knowledge, and attitude. So, it may display that the student worksheet evolved through the motive and accuracy of the material, the guided inquiry model, science literacy, and the suitability of the model with science literacy competencies.

The criteria for presenting the developed student worksheet obtained a percentage value of 78% in the valid category because the percentage obtained ≥ 61% (Riduwan, 2015). This indicates that the student worksheet advanced was via way of means of the criteria for presenting the material sequence and completeness of presentation systematically and clearly.

The language criteria of student worksheet were developed to obtain a percentage value of 90% in the valid category because the percentage obtained ≥ 61% (Riduwan, 2015). This indicates that the evolved student worksheet has used the right grammar and spelling.

The student worksheet graphicness criteria was developed to obtained a percentage value of 93% in the category was very valid because the percentage obtained ≥ 61% (Riduwan, 2015). This indicates that the advanced worksheet has used the proper format and length of text, images, and tables accordingly, clear terms, formulas, and symbols as well as interesting student worksheet design colors, models, and displays. The validation data was presented in Figure 4.

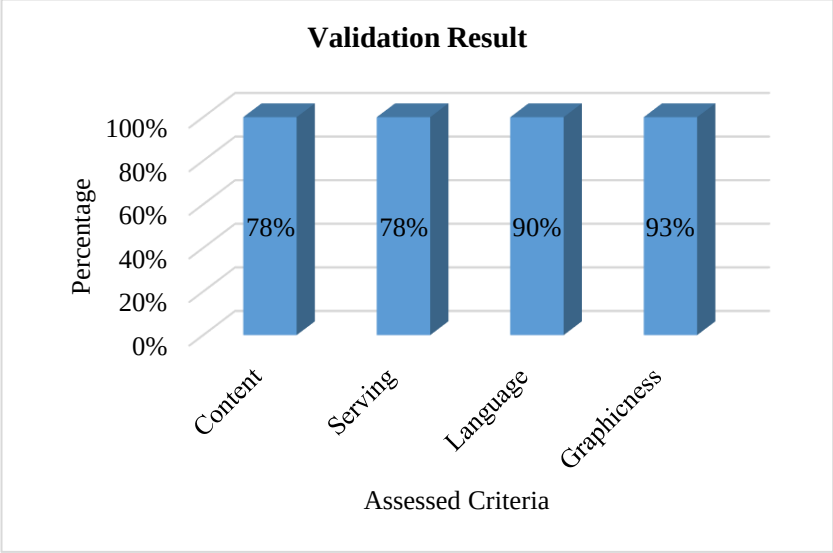

Figure 4. Student Worksheet Validation Results

Figure 4 showed the results of student worksheet validation oriented to the inquiry guided by the reaction rate material to enhance the scientific literacy of Pharmaceutical Vocational Students who had been advanced to fulfill the eligibility criteria. This is relevant to the research results of (Ain & Mitarlis, 2020) and (Wahdaniyah & Yonata, 2020) that the student worksheet-oriented guided inquiry was valid in terms of content, presentation, language, and graphics.

The Practicality of Student Worksheet

The practicality of the student worksheet advanced targets to recognize that student worksheets may be used in studying with guided inquiry stages. This was reviewed from the results of students' responses to the developed student worksheet and student activities.

Analysis of Student Response Questionnaire Results

Student response questionnaires were used to discover the practicalities of the developed student worksheet. Data on the results of student responses was presented in Figure 5.

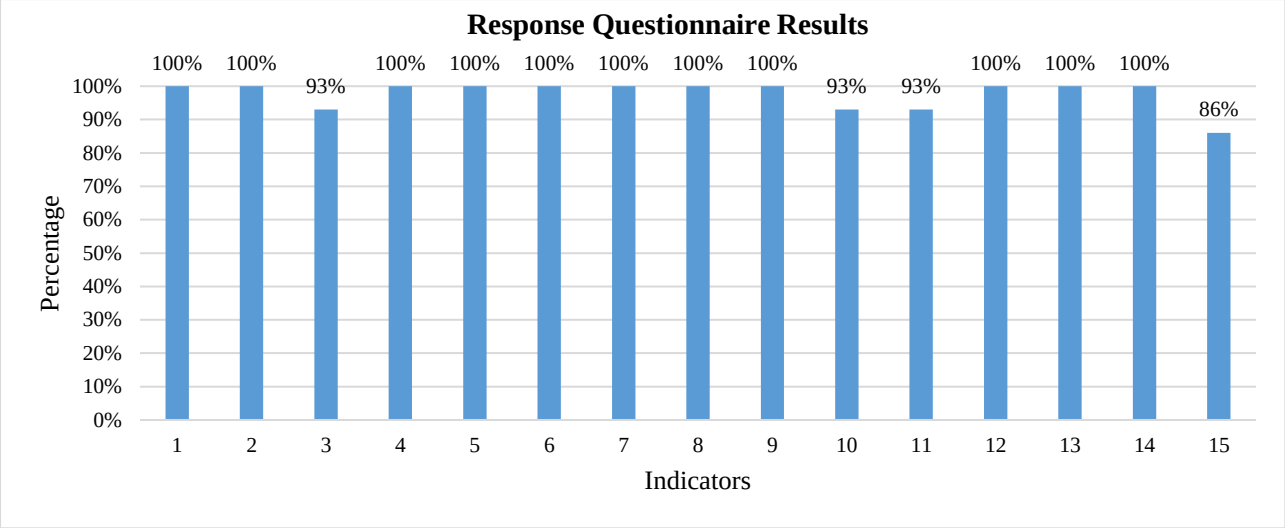

Figure 5. Results of the Student Response Questionnaire

Figure 5 showed the data of the results of the student's response questionnaire, practicality criteria developed to obtained a percentage value of 93-100% on each indicator on the response questionnaire in the category was very practical. This suggests that the students' worksheet evolved and was straightforward to apprehend. The phenomenon offered in the student worksheet can foster learner's interest so that it could make it less difficult for newbies to apprehend the cloth taught. The indicator of the learner response questionnaire was presented in Table 7.

Table 7. Learner Response Questionnaire Indicator

No.	Item	P (%)	Criteria
1	1	100	Very Practical
2	2	100	Very Practical
3	3	93	Very Practical
4	4	100	Very Practical
5	5	100	Very Practical
6	6	100	Very Practical
7	7	100	Very Practical
8	8	100	Very Practical
9	9	100	Very Practical
10	10	93	Very Practical
11	11	93	Very Practical
12	12	100	Very Practical
13	13	100	Very Practical
14	14	100	Very Practical
15	15	86	Very Practical
Average		97,67	Very Practical

Description:
Item 1 = Appearance
Item 2 = Fill
Item 3 = Phenomenon Serving
Point 4 = Understanding of Phenomena
Item 5 = Material Suitability
Item 6 = Material Serving
Item 7 = Language Usage
Item 8 = Image Usage
Item 9 = Experiment
Item 10 = Problem Formulation
Point 11 = Hypothesis
Item 12 = Trial Design
Item 13 = Trial Results
Item 14 = Data Analysis
Item 15 = Conclusion

Table 7 showed the data of the student's response questionnaire, all questionnaire indicators by students were declared very practical. Some

indicators obtained a maximum score of 100% on questions 1, 2, 4, 5, 6, 7, 8, 9, 12, 13, and 14. While the statements of items 3, 10, 11, and 15 obtained a percentage below 100%.

Analysis of Student Activity Observation Results

At the time of the trial stage, the implementation of a student worksheet become finished for students in one of the Pharmaceutical Vocational Schools. In the implementation of practicum, observations were carried out, and the results of the observation of student activities was presented in Figure 6.

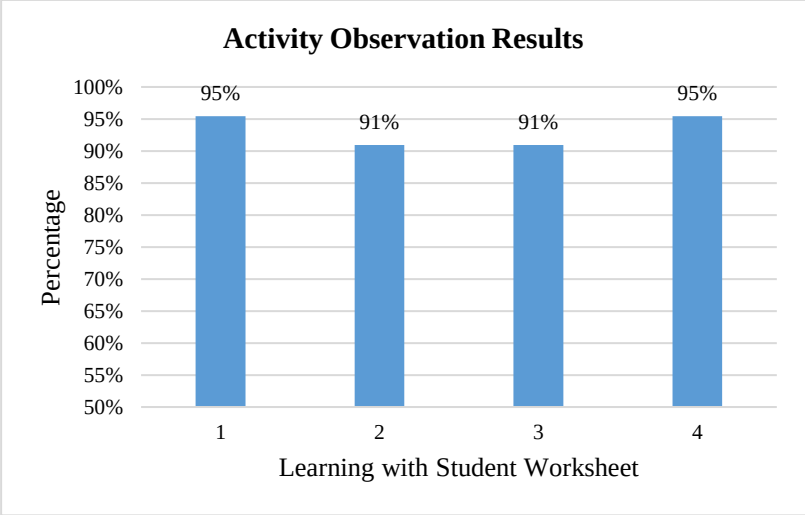

Figure 6. Student Activity Observation Results

Description:
1 = Student worksheet concentration factor
2 = Student worksheet surface area factor
3 = Student worksheet temperature factor
4 = Student worksheet catalyst factor

Figure 6 showed the results of observation of student activities that obtained a percentage value of 93%. This indicates that the relevant activity carried out by learners was higher than irrelevant activities. The implementation of learning activities was very good using the developed student worksheet. The purpose of the learning using student worksheet was to find the draft of factors that influence the reaction rate,supported by the existing guided inquiry stages and to improve science literacy skills in learning activities using student worksheets.

Based on students' response data and student activities, the inquiry-oriented student worksheet was guided by reaction rate materials to improve the scientific literacy of Pharmaceutical Vocational Students that were developed to meet the criteria of practicality.

Effectiveness of Students Worksheet

The effectiveness of the student worksheet advanced has goals to discover the information of the concepts and skills of student science literacy through the use of the developed student worksheet with the final achievement of learning activities described by the completion of learning outcomes or classical completion and improving the ability of science literacy of learners.

Classical Completeness

The completeness of individual learning outcomes can measure the level of understanding of the concepts taught, learning outcomes can be declared complete if the value obtained at least 75. Classical completion obtained a minimum percentage of 85% (Permendikbud, 2014). The completeness of learners' learning outcomes can be seen in the comparison of Pretest and Posttest scores as presented in figure 7.

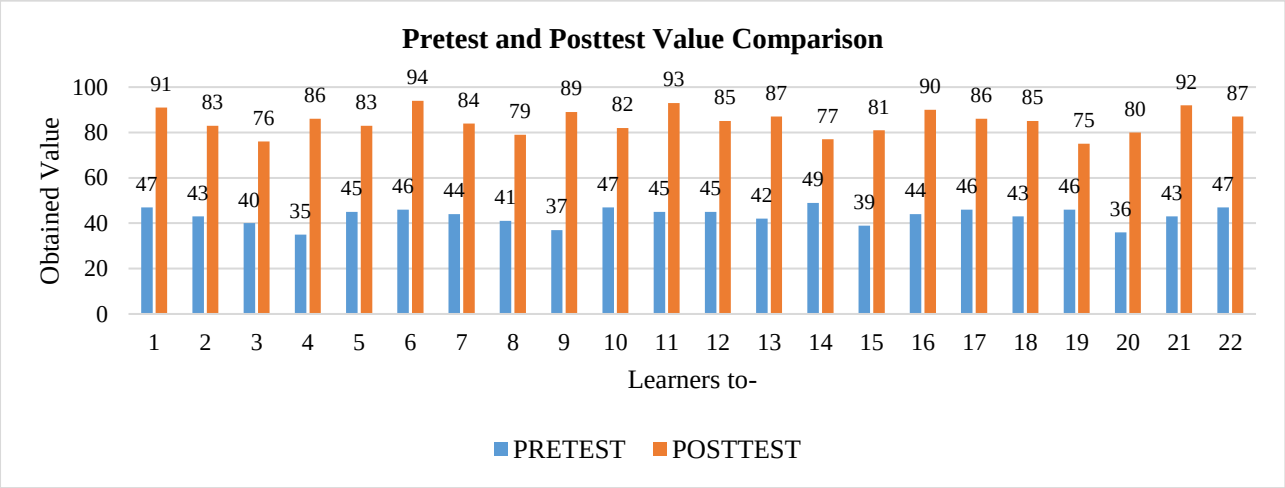

Figure 7. Pretest and Posttest Value Comparison Results

Figure 7 showed the comparison data of pretest and posttest scores.The pretest results given to 22 learners, obtained a score of ≤ 75 for each learner with an average of 43. The completeness of learners' learning outcomes in the pretest was 100% failed. While the posttest obtained a value of ≥75 for each learner with an average of 85 grades obtained. The completeness of learners' learning outcomes in the posttest was 100% complete. The percentage of completeness of learners' learning outcomes was presented in Figure 8.

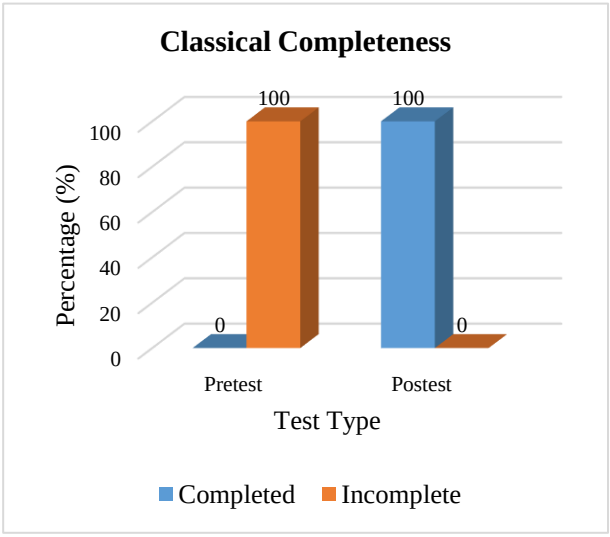

Figure 8. Completeness of Learning Outcomes

Figure 8 showed data on the percentage of completeness of learners' learning outcomes, obtained a percentage of student learning outcomes by 100%. The pretest score is 100% failed because the material factors that affect the reaction rate have not been given. Meanwhile, at the post-test, the learners are 100% completed. This shows that the process of exposure with guided inquiry models was used in learning using student worksheets so that learners find concepts about materials and can understand the concept of material factors that affect reaction rates.

Improved Science Literacy Skills

Data on the consequences of enhancing the cap potential of student technological know-how literacy was used to decide the effectiveness of student worksheets in enhancing technological know-how literacy. The domain of science literacy that was taught and expected to increase in this development research were 4 domains, namely context domains (personal, local/national, and global), competency domains (explain scientific phenomena, design and evaluate scientific investigations and interpret scientific data and evidence), knowledge domains (content/content, procedural and epistatic), attitude domains (interest in science and technology, appreciate/assess scientific approaches to investigation if needed and awareness and concern for problems and the environment). The results of the enhancement in the N-gain score of student science literacy was seen in Table 8.

Table 8. N-gain Score Results in Improved Science Literacy

Student	Pretest	Posttest	N-Gain	Category
1	47	91	0.83	High
2	43	83	0.70	High
3	40	76	0.60	Medium
4	35	86	0.78	High
5	45	83	0.69	Medium
6	46	94	0.89	High
7	44	84	0.71	High
8	41	79	0.64	Medium
9	37	89	0.83	High
10	47	82	0.66	Medium
11	45	93	0.87	High
12	45	85	0.73	High
13	42	87	0.78	High
14	49	77	0.55	Medium
15	39	81	0.69	Medium
16	44	90	0.82	High
17	46	86	0.74	High
18	43	85	0.74	High
19	46	75	0.54	Medium
20	36	80	0.69	Medium
21	43	92	0.86	High
22	47	87	0.75	High

Table 8 showed the results of the N-gain score, retrieved an enhancement in high category of science literacy skills, namely 14 learners because the score obtained ≥ 0.7. The increase in the medium category was 8 learners due to the score obtained $0.3 \leq g < 0.7$. The percentage increased in high categories by 64% and medium categories by 36%.

Table 9. Average Test Result in Improved Science Literacy

$\bar{x}$ Pretest	$\bar{x}$ Posttest	N-Gain	Category
43.18	84.78	0.73	Medium

From the consequences of the evaluation of facts at the mastering of students' science know-how literacy skills, the average N-gain score obtained 0.73 in the high category because the results obtained ≥ 0,7. With the increasing ability of science literacy obtained by students, it interpreted that the developed student worksheet has met the effectiveness criteria to improve science literacy skills.

A student worksheet is developed with a guided inquiry learning model so that they can increase students' science literacy by optimizing aspects of literacy including declarative, procedural, and epistemic knowledge.

Based on the completed data and N-gain score, the inquiry-oriented Student worksheet is guided by reaction rate materials to improve the science literacy of Pharmaceutical Vocational Students that were developed to meet the criteria for effectiveness.

CONCLUSION

Based on the finding and discussion, it concluded that the inquiry-oriented student worksheet was guided by reaction rate materials to improve the scientific literacy of Pharmacy Vocational School learners and feasible to use from the following criteria. The validity of the developed student worksheet in terms of content, presentation, language, and graphing obtained percentages of 78%, 78%, 90%, and 93% with valid / very valid categories. The practicality of the student worksheet developed was reviewed from the results of the student's response of 98% with a very practical category and the results of observation of student activities by 93% showed that the relevant activities carried out by students were higher than irrelevant activities. The effectiveness of the developed student worksheet was reviewed from the results of learning completion to obtain a percentage of 100% with the complete category and an average N-gain score of 0.73 with a high category.

This research was a development of LKPD that combines the guided inquiry learning model with science literacy with a widespread discussion of the context domain and competency domain. Therefore, it needs to conduct further research, such as combining the guided inquiry learning model with science literacy by further expanding the context of science literacy in the domain of knowledge and the domain of attitudes, namely with components and instructions in LKPD adapted to the knowledge of students.

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