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Development of a Guided Inquiry-Scientific Laboratory (GISL) Based Health Chemistry Practicum Module

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ABSTRACT: Chemistry practicum learning requires a comprehensive approach, which improves understanding of concepts and develops various essential skills needed in the professional and academic world. This research aims to develop a Guided Inquiry-Scientific Laboratory-based Health Chemistry module and conduct empirical feasibility tests. This module is designed with a guided inquiry approach integrated with scientific methods in laboratory activities. The practicum module was developed for second-grade vocational school students in health expertise with material covering colloids, hydrocarbons, polymers, biomolecules, and chemical separation. This development research uses the Borg and Gall model, which consists of planning, organizing, implementing, assessing, and analyzing data. This research was only carried out to the validation stage by material experts, media experts, peer reviewers, and reviewers (five Health Vocational School teachers). The assessment carried out by the reviewer includes eight assessment aspects with 30 assessment indicators. Data was collected through questionnaires, observations, and interviews. Data analysis was carried out descriptively, quantitatively, and qualitatively, guided by ideal assessment criteria to determine the quality of the practicum module. The research results show that the Guided Inquiry-Scientific Laboratory (GISL) based Health Chemistry practicum module that has been developed has a score of 132.52 with an ideal percentage of 88.3467% in the very good (SB) category. This indicates that this module is suitable for use in health chemistry practicum learning, and it is hoped that this research can be continued at the next stage.

Keywords: Practicum Module, Health Chemistry, Guided Inquiry-Scientific Laboratory

INTRODUCTION

Practicum is a part of teaching that allows students to test and implement what is obtained from theory in real situations. Practicum requires tools and materials, which are also methods that cannot be excluded from science learning [1]. Health chemistry practicum strengthens theoretical understanding and laboratory skills [2]. In practicum activities, cognitive, affective, and psychomotor aspects can be measured carefully, thereby making it possible to achieve a more meaningful learning process through skills processes [3]. However, many chemistry practicum modules currently available are still conventional, namely "recipe" based laboratory learning with detailed instructions to follow so that students are less able to develop their critical thinking skills and analytical abilities optimally. Therefore, an approach is needed that requires students to be actively involved in the learning process through directed investigation and exploration.

The scientific approach is a learning process designed so students actively construct concepts, laws, or principles through observation, formulating problems, formulating hypotheses, collecting data using various techniques, analyzing data, drawing conclusions, and communicating the "discovered" concepts, laws, or principles [4]. The scientific approach is an approach to learning activities that prioritizes student creativity and findings [5]. This approach has proven to be quite effective in improving students' critical thinking skills [6], scientific attitudes and scientific literacy [7, 8], and learning outcomes and student retention [9].

Several studies have been carried out regarding the development of learning media based on science process skills [10,11], scientific approach [5, 9], and integrated science process skills [12]. Some forms of media include Inorganic Chemistry Practicum Worksheets [13], invertebrate systematics practicum module [14], genetics practicum guide [11], and thermochemistry teaching module [15]. Science process skills in practicum include 1) the ability to design an experiment: formulate objectives, prepare tools and materials, create hypotheses, and develop procedures; 2) conduct experiments: take data, organize data and interpret data, and organize data and interpret experimental data, 3) draw up conclusions based on concepts and facts honestly, and 4) make an experimental report [16].

Several developments in inquiry-based learning in practicums have also been carried out [17,18] [19, 20]. Inquiry laboratory builds empirical laws based on measurements and variables. Inquiry-based modules are designed as learning resources or media that refer to the characteristics and syntax of the inquiry model, starting with observation, manipulation, generalization, verification, and application [21]. Implementing Guided Inquiry-based Physics teaching materials shows that science process skills have increased [22]. Testing the effectiveness of Guided Inquiry-Based Physics practicum learning shows that there is a significant difference in improving students' adaptive movements (skills). Other research shows that students' creative thinking skills increased in the Nata De Whey Kefir practicum by implementing Guided Inquiry-based worksheets. Inquiry learning has been proven effective in improving the quality of problem-solving and critical thinking skills in science learning [23]. Guided Inquiry practicum guidelines direct students to design and discover science concepts for themselves, which can make the material stored in memory longer [1]. An analysis of students' cognitive abilities regarding guided inquiry-based teaching media has been carried out [24], showing that student's intellectual and emotional factors need to be involved in learning; they need to link new information to relevant concepts in a person's cognitive structure.

Several researchers have developed guided inquiry-integrated practicum worksheets for analyzing laboratory skills [25], training science process skills [26], improving students' creative thinking [27], increasing students' understanding of concepts [28], and improving student learning outcomes [29]. Guided inquiry has a distinctive characteristic, namely that the role of students is more dominant and active, while the teacher directs and guides students in the proper or correct direction. The learning process is no longer extended-centered Teacher Learning but Student-Centered Learning, with teachers acting as monitors and facilitators of learning [8]. The learning process in vocational schools needs to be designed to investigate how knowledge is acquired so that it can train students' skills and abilities. Inquiry-based learning can be obtained from carrying out practicums in the laboratory. However, most students only focus on practicum procedures rather than constructing basic ideas or concepts. This shows that an approach is needed to prepare effective practicum guides so that students are more active in exploring information and constructing their knowledge sustainably.

Based on this description, combining scientific and inquiry approaches in learning provides a richer and more meaningful educational experience. Students gain theoretical knowledge and develop essential practicum and analytical skills. In this way, students are better prepared to face future challenges in academic contexts and everyday life. The novelty of this research is the combination of guided inquiry and scientific laboratory methods, especially in health chemistry, which has never previously been developed with a practical module using this approach. The Guided Inquiry-Scientific Laboratory (GISL) based learning approach offers an innovative solution to increase the effectiveness of practicum learning. This research aims to develop a GISL-based health chemistry practicum module and determine the feasibility test of the module from various aspects. By carrying out this feasibility test, practicum diktats can be produced based on the curriculum and educational standards, providing a deeper and more meaningful learning experience for students. Modules successfully tested for suitability will become a valuable learning resource in chemistry education.

RESEARCH METHODS

The model in this development research is procedural, namely a descriptive model, outlining the steps that must be followed to produce a product [30]. The procedural model has several stages: planning, organizing, implementation, assessment, and data analysis. These five stages result from adapting the Borg and Gall development model. The planning stage consists of activities reviewing the Core Competencies (KI) and Basic Competencies (KD) in health chemistry according to the curriculum and preparing experimental materials; the organizing stage consists of collecting references, creating cover designs and layout templates, creating experimental materials in a structured written format; the implementation stage consists of creating a practicum module using Microsoft Word 2013, review by peer reviewers; assessment stage from 3 peer reviewers, material experts and media experts, as well as reviewers (5 Health Vocational School chemistry teachers).

Method of Qualitative Analysis

The data analysis stage consists of qualitative product development process assessment data in the form of input from material experts and media experts and peer reviewers, as well as product quality assessment data by reviewers. The aspects assessed in this development research (from aspect A to aspect H) are aspects of writing and organization of practicum modules, correctness of activity concepts, depth of material, clarity of sentences and level of readability, and guided inquiry-scientific laboratory (GISL) content, respectively. Level of implementation of practicum activities, assessment of learning outcomes, and physical appearance of practicum modules. These eight aspects are translated into 30 assessment indicators. The product quality of the GISL-based health chemistry practicum module was analyzed using a Likert scale with conditions as in Table 1. The average score was converted into a scale value of 5 and then converted into qualitative data by entering the score range Very Good (SB), Good (B), Sufficient (C), Poor (K), and Very Poor (SK).

TABLE 1. Formula for Determining Quality Categories

Score Range (*i*) Quantitative	Quality Category
$\bar{X}$>(M*i* + 1,8 Sb*i*)	Very Good (SB)
(M*i* + 0,6 Sb*i*) < $\bar{X}$ ≤ (M*i* + 1,8 Sb*i*)	Good (B)
(M*i* - 0,6 Sb*i*) < $\bar{X}$≤ (M*i* + 0,6 Sb*i*)	Sufficient (C)
(M*i* - 1,8 Sb*i*) < $\bar{X}$ ≤ (M*i* - 0,6 Sb*i*)	Poor (K)
$\bar{X}$< (M*i* - 1,8 Sb*i*)	Very Poor (SK)

Information:
M*i* (ideal mean) = ½ x (ideal maximum score + ideal minimum score)
Sb*i* (ideal standard deviation) = (1/2 x 1/3) x (ideal maximum score-ideal minimum score)
Ideal maximum score = Σ criteria items x highest score
Ideal minimum score = Σ criteria items x lowest score

RESULT AND DISCUSSION

This research aims to develop a guided inquiry-scientific laboratory (GISL) based health chemistry practicum module. This development research adapts the five initial stages of the Borg and Gall development model. The five initial stages in the Borg and Gall development model include research and information, planning, developing a preliminary form of product, preliminary field testing, and primary product revision. After adjusting the Borg and Gall development model and this development research, five stages of practicum module development were obtained: planning, organizing, implementing, assessing, and data analysis.

A. Planning

TABLE 2. Analysis of Basic Competencies and Core Competencies

Core Competencies	Basic Competencies	Investigations
4. Process, reason, and present in the concrete and abstract domains related to the development of what they learn at school independently, act effectively and	4.7 Make various colloidal systems with the materials around them and analyze the properties of the colloid system created	1.1 How do you make a gel? Can gel be burned? 1.2 How to investigate the coagulation properties of colloids?
	4.8 Classifying hydrocarbon compounds and their derivative	2.1 Are there C and H atoms in hydrocarbon compounds?
	4.9 Classify polymers based on their properties	3.1 What type of polymer is this, thermoplastic or thermosetting?

creatively, and be able to carry out specific tasks under direct supervision	4.10 Select biomolecules (water, carbohydrates, proteins, lipids, and nucleic acids) based on their properties	4.1 Which solutions favor the carbohydrate test? 4.2 Which solvent allows liquids to mix perfectly? 4.3 Are there peptide bonds in protein compounds?
	4.11 Separating substances from mixtures and determining the levels of a substance through quantitative analysis	5.1 What is the difference between the experimental and original crystals? 5.2 Does the acetic acid level in the vinegar match the level stated on the bottle label?

The planning stage consists of analyzing the Core Competencies (KI) and Basic Competencies (KD) in health chemistry according to the curriculum and preparing experimental materials. This chemistry practicum module refers to KI and KD as outlined in the 2013 curriculum for class XI semester II students in health expertise. The materials in this module are colloids, hydrocarbons, polymers, biomolecules, and chemical separation. This module is divided into nine investigations (Table 2). The most important aspect of the success of an educational process with the 2013 curriculum is the learning approach and strategy. One approach that is being promoted is scientific inquiry. In this approach, students act as scientists and have a scientific attitude when experimenting. The cognitive indicators developed are remembering, understanding, applying, analyzing, evaluating, and creating [31].

B. Organizing

The organizing stage consists of collecting references, creating cover designs and layout templates, and creating experimental material in a structured written format. In developing practicum modules, references are collected by gathering sources as a basis for preparing chapters and sub-materials that will be put into practice. This stage also formulates specifications for GISL-based health chemistry practicum modules.

C. Implementation

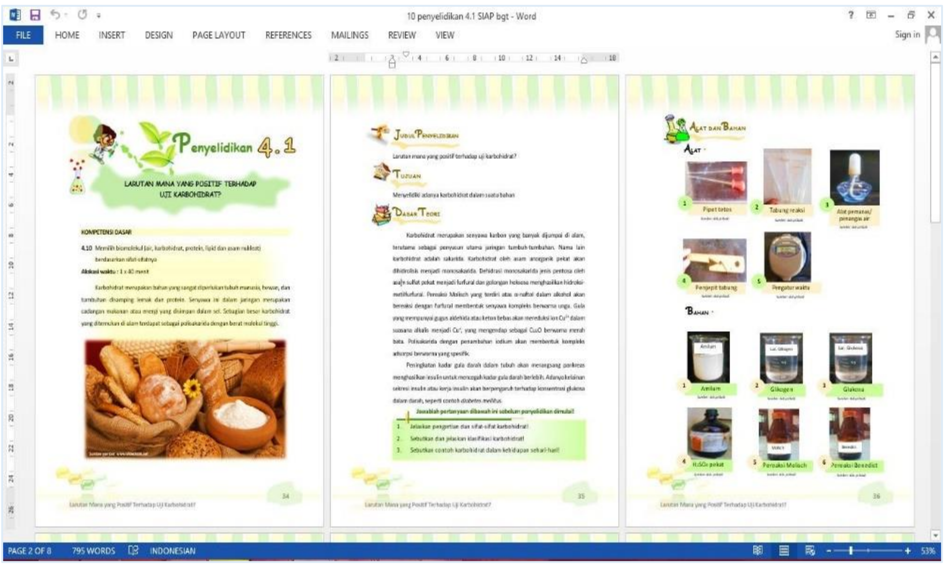

FIGURE 1. Doing Practicum Modules with Microsoft Word 2013

The implementation phase consists of creating a practicum module using Microsoft Word 2013 (Figure 1) and reviewing it from peer reviewers. Practicum material is presented in a previously designed template. The module template design consists of cover and soft cover pages, title and subtitle templates, header and footer, and the overall layout of the module contents. This module has undergone several cover revisions with a revised appearance, as in Figure 2.

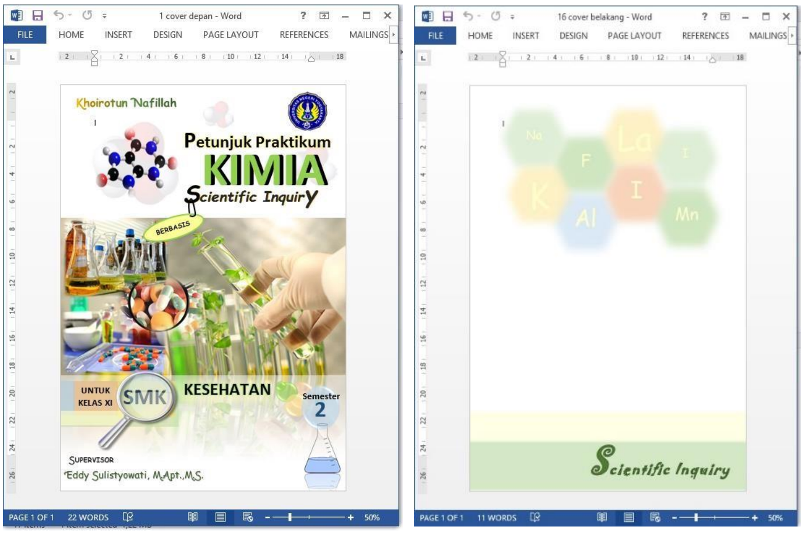

FIGURE 2. Front and Back Covers of the Practicum Module

In this module, there is a special page explaining the characteristics of GISL, which differentiates it from other modules. The special page is shown in Table 3, and the health article page can be seen in Figure 3.

TABLE 3. Module Specifications Based on Guided Inquiry-Science Laboratory (GISL)

No	Contents Guided Inquiry-Scientific Laboratory (GISL)	Explanation
1	The title is a question, not a statement	Its packaging in a question sentence aims to motivate students to conduct investigations.
2	Students are given a brief theoretical basis	The theoretical basis becomes a reference learning resource for students to investigate. However, this practicum chemistry module only briefly presents the theoretical basis. Students are expected to actively search for other references independently.
3	There are answers to questions before the investigation	Answers to questions before the investigation in this module aim to invite students to recall general chemistry concepts in specific chapters.
4	There is investigative information	Investigation information aims to provide direction and guidance to students. However, these instructions are still ill-structured, so only certain information is considered important for students to know.
5	There is a temporary suspicion (hypothesis)	Hypothesis is one of the steps in the GISL approach. A hypothesis is a temporary answer to a problem being studied. The validity of the hypothesis needs to be tested through investigations that students will carry out.
6	Procedures are not written instructional	Students are required to write their own investigation procedures, which is intended to encourage creativity and the use of logic or reasoning.
7	There are questions after the investigation	Questions after the investigation are a means of measuring students' cognitive abilities.

The development research that has been carried out has resulted in a chemistry practicum module based on the Guided Inquiry-Scientific Laboratory (GISL), printed in full color on A4 paper size (21 cm x 29.7 cm) 80 grams, consisting of 106 pages (including cover). The components in this module are cover, foreword, table of contents, laboratory rules, chemical laboratory equipment, techniques for working on chemical laboratory equipment, danger symbols in the laboratory, core competencies and basic competencies, getting to know GISL-based modules more closely, practicum instructions for each research materials, periodic table of elements, and bibliography.

FIGURE 3. Health Article Page

D. Assessment

The first assessment stage is suggestions and input from 3 peer reviewers and material and media experts. Peer reviewers are colleagues conducting development research and know the criteria for quality practicum modules. These suggestions are used to revise the practicum module. This module is also reviewed by material and media experts, namely chemistry lecturers who have knowledge of the materials being practiced for Health Vocational Schools and understand the quality standards for suitable practicum modules. Suggestions and input from media and material experts are used to revise the chemistry practicum module so that the module is better and of better quality. The results of this revision were then assessed by reviewers, namely five vocational chemistry teachers in the field of health expertise in Yogyakarta, namely SMK Kesehatan Cipta Bhakti Husada, SMK Kesehatan Sadewa, SMK Kesehatan Insan Mulia, SMK Kesehatan Binatama, and SMK Kesehatan Bantul. Suggestions and input given by reviewers will be used as material for consideration when carrying out revisions to obtain the final product. Assessment of the quality of the practicum module is carried out by filling in an assessment sheet in the form of a checklist that has been provided based on the criteria for assessing the quality of the practicum module and the description of the criteria into indicators for assessing the chemistry practicum module. In terms of assessment, this research shows that the Guided Inquiry-Scientific Laboratory (GI-SL) method requires more diverse evaluation instruments than traditional methods, such as project-based assessment [31] and observation of science process skills [14]. Other studies that use expository methods rely only on written tests to measure concept understanding [24]. In contrast, GI-SL emphasizes a more holistic assessment, including analytical [25], collaborative skills, and problem-solving abilities [25], often overlooked in conventional assessments.

E. Data Analysis

Qualitative data from reviewer assessments is converted into quantitative data using the data analysis method. This quantitative data is tabulated and analyzed for each chapter and aspect of the assessment. The average score of each component is converted into a scale of 5 before being returned to qualitative data using quality categories based on predetermined ideal scores. Table 4 shows that the reviewer's assessment results for each indicator and aspect of the criteria assessed in the practicum instructions module received the very good quality category.

TABLE 4. Average Score for Each Chapter of Practicum Module

Assesment Aspect	Criteria	Score for Each Chapter				
		I	II	III	IV	V
A	1, 2	44	44	44	45	45
B	3, 4, 5, 6	89	91	91	87	87
C	7, 8	42	42	46	44	41
D	9, 10, 11, 12, 13	111	110	112	110	109
E	14, 15, 16, 17	90	87	90	90	89

Assesment Aspect	Criteria	Score for Each Chapter				
		I	II	III	IV	V
F	18, 19, 20, 21	89	91	90	91	88
G	22, 23, 24	61	61	64	64	64
H	25, 26, 27, 28, 29, 30	132	132	134	134	138
Total Score		658	658	671	665	661
Average Score of Each Chapter		131,6 (SB)	131,6 (SB)	134,2 (SB)	133 (SB)	132,2 (SB)
Total Average Score		**132,52 (SB)**				

Information:
A = aspects of writing and organization of the practicum module
B = aspect of the truth of the concept
C = depth aspect of the material
D = aspects of sentence clarity and readability level
E = GISL load aspect
F = aspect of the level of implementation of practicum activities
G = aspects of learning outcomes assessment
H = physical appearance aspect of the practicum module

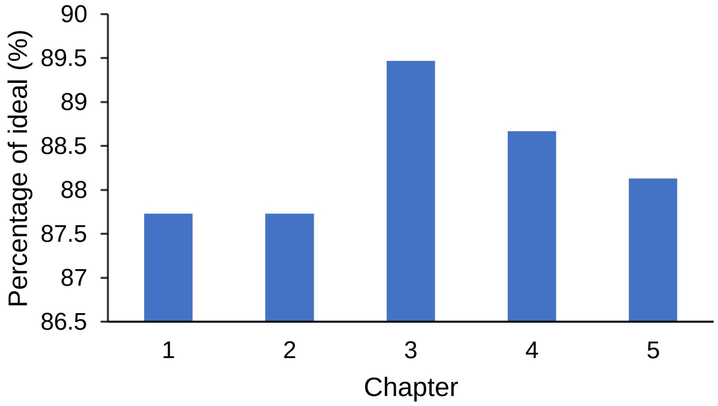

FIGURE 4. Percentage of Ideality for Each Chapter

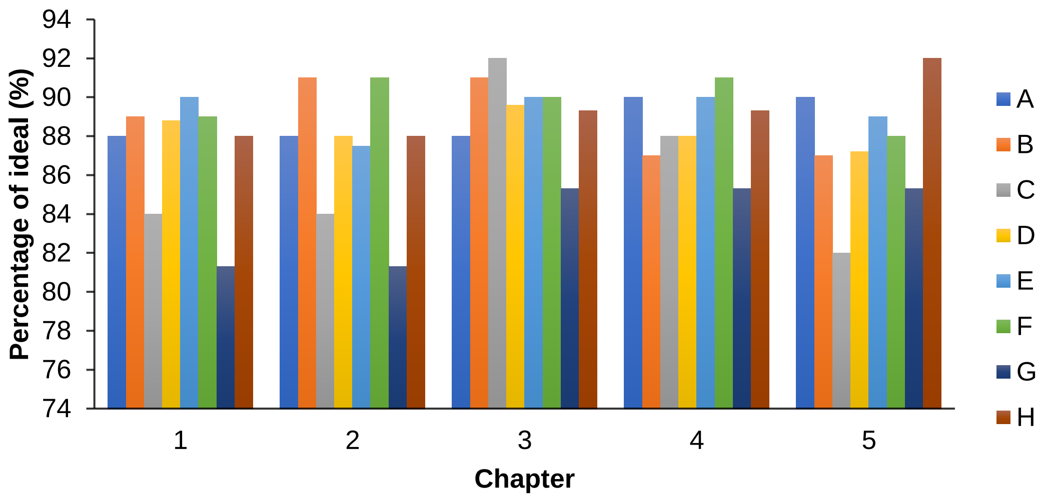

FIGURE 5. Percentage of Ideality for Each Aspect

1. Colloid System

The first chapter is Colloid Systems. In Chapter 1, practicum can encourage students to conclude a concept and write down work steps, allowing students to write down hypotheses and test hypotheses independently. This chemistry practicum module also fosters students' curiosity and interest in gathering more information. For example, in investigation 1.1 about burning gel, students will be motivated and curious to prove the reaction of the gel if it is burned.

Based on the reviewer's assessment, the questions in Chapter 1 were able to measure cognitive aspects but were not able to measure psychomotor and affective aspects. Therefore, the practicum module needs to be improved so that there are tables to measure psychomotor and affective aspects. Apart from that, the questions in the practicum can measure students' basic abilities according to learning outcome indicators and direct students to draw conclusions. The evaluation instructions in this chapter are good because they are straightforward to understand. The physical appearance aspect of the practicum module (aspect H) obtained an average score of 26.4 with very good quality (SB) and an ideal percentage of 88%. This physical appearance aspect includes six assessment criteria, namely: 1) attractive book design, 2) orderly and good book page design, 3) clear writing and image printing, 4) physical appearance of the practicum module can attract students' attention to learning, 5) clarity of sentences that accompanies an image/illustration by the image being described, and 6) strategic placement of the illustration.

2. Hydrocarbon

The second chapter is Hydrocarbons. Based on the reviewer's assessment, all concepts and sub-concepts are by the existing syllabus and have the correct sequence. Apart from that, the explanation of the material is also very in line with the concept of chemistry material in the 2013 curriculum for class XI Health Vocational Schools. This chapter has a very good aspect of conceptual truth (B) because the explanation of the practicum course emphasizes science and technology in the health sector and is accompanied by examples of other applications. Chemists also put forward the concept of practicum activities without undergoing development. The explanation of concepts is appropriate to the class XI level, and each practicum has clear learning objectives. Most educators assess the depth of concepts and hydrocarbon material by textbooks and the thinking maturity of class XI students. In general, the clarity of the sentences and the level of readability in Chapter 2 are good. However, some languages still need to be added for students to understand.

The GISL (E) load aspect scored 17.5, and the ideal percentage was 87.5%. The practicum presentation in Chapter 2 encourages students to conclude a concept and write down work steps systematically, allowing students to write and test hypotheses independently. The practicum in Chapter 2 is related to everyday life, so students are encouraged to gather more information related to the practicum material. This way, students will be more independent in finding and solving problems in practicum activities. The practicum implementation aspect (F) shows that the practicum requires a longer time allocation but can still be carried out during school hours. Practicums in this material provide direct experience to students as a form of theory implementation. Practicum material on hydrocarbons is accessible to students, but students must master heating substances with a test tube. Students must be careful and use personal protective equipment because gas comes out due to the reaction. The questions in the practicum can measure students' basic abilities according to learning outcome indicators. In general, the physical appearance of the book is very good, but some pictures could be clearer, and the position of the pictures needs to be improved.

3. Polymers

The third chapter is Polymers, which consists of an investigation entitled "What Type of Polymer is this, thermoplastic or thermosetting?". This investigation aims to investigate the types of polymers based on their properties. Students are directed to discover chemical concepts about types of polymers using simple tools and materials. Polymers are closely related to everyday life; however, when studying chemistry in high school/vocational school, it is scarce to find practicums related to this. Students' attitudes toward using polymers in everyday life and the impact of polymer waste can be formed by introducing the concept of polymer types based on their properties. Therefore, this chemistry practicum module received attention from reviewers, as evidenced by the highest score obtained.

Aspect A has an ideal percentage of 88%, indicating that all concepts and sub-concepts are by the existing syllabi and have the correct order. The concept truth aspect has an ideal percentage of 91% because it is very close to real life so that the practicum can connect science, technology, and life, especially in the health sector. The depth of the concept and the polymer material are to the textbook and the thinking maturity of class XI students. Aspect D shows that the language used is communicative, has no double meaning, and is by EYD. However, there are still some words that must be replaced to make sure students understand. The GISL content aspect encourages students to conclude a concept and write down work steps systematically. Students need to prepare themselves and be familiar with the tools and materials that will be used so that the practicum runs safely and smoothly. A practicum on this material is safe if the practicum technique is carried out correctly. However, students need to be careful because one of the ingredients in this practicum is solid acids and bases. The book's physical appearance can attract students' attention to learning because it is designed colorfully and uses a typeface that is easy to read.

4. Biomolecules

The fourth chapter is Biomolecules, which includes carbohydrate tests, lipid properties tests, and protein tests. The concept of practicum activities in Chapter 4 is presented to be appropriate to the concepts of chemists and the student's grade level. Apart from that, foreign terms related to health expertise increase students' knowledge. The GISL load aspect has an ideal percentage of 90%. The practicum presentation of Chapter 4 allows students to write hypotheses and test the hypotheses independently. This module can stimulate students' curiosity and interest in gathering more information. Students conduct tests on the properties of carbohydrates, lipids, and proteins, which emphasize students' processing skills and thinking power.

Some reviewers consider that the practicum work in Chapter 4 is safe if the practicum techniques are carried out correctly, for example, the warm-up technique. The questions in the practicum can measure students' basic abilities according to learning outcome indicators and can direct students to conclude. The evaluation instructions in this chapter are good because they are clear and easy to understand. The physical appearance aspect of the practicum manual (aspect H) received an average score of 26.8 with very good quality (SB) and an ideal percentage of 89.33%. The book's physical appearance is good and can attract students to read and understand the contents of the book.

5. Separation of Chemical Substances

The final chapter is Separation of Chemical Substances, which consists of two investigations: crystallization and acid-base titration. Aspect A has an ideal percentage of 90%, which means all concepts and sub-concepts are by the curriculum. The concept of practicum activities in Chapter 5 is presented so that it is appropriate to the concepts of chemists and the student's grade level. Practicum instructions are also accompanied by basic competencies and goals to be achieved after the practicum. The language used is communicative, does not have a double meaning, and is by EYD. The practicum implementation aspect in Chapter 5 will provide valid data if the practicum technique is carried out correctly, for example, the titration technique. According to reviewers, this practicum provides students with direct experience through the steps taken to solve problems. This practicum can also be carried out during school hours according to the time allocated; tools and materials are easy to obtain and safe for students to carry out.

This module received several suggestions and input from reviewers, so it must be improved. In general, things that need to be improved include pictures of laboratory equipment, danger symbols, pictures of working techniques in the laboratory, and clarity of sentences accompanying a picture/illustration. Data analysis shows that the overall quality assessment of the chemistry practicum instruction module is 132.52, with very good quality and an ideal percentage of 88.3467%.

The Guided Inquiry-Scientific Laboratory (GISL) approach to laboratory teaching involves presenting a problem or question to students and guiding them through designing and conducting experiments to investigate and find solutions. Inquiry-based practicums allow students to learn divergent thinking and engineer a process independently. This method differs from conventional laboratory teaching styles, where students take a more active role in learning. Through GISL, students are expected to develop critical science process skills, such as creating hypotheses, identifying tools and materials, analyzing data, and summarizing the results of their investigations. This approach not only increases students' understanding of scientific methods [7, 28, 19, 32], but also fosters critical thinking skills [23], creative thinking [27], solving problems [31, 33], and communicating his findings effectively. GISL integration allows students to be active in solving problems, so they are expected to have these competencies to solve problems in everyday life.

This GISL-based chemical module product has several advantages. The advantages of this product are the chemistry practicum module, which was developed by the Health Vocational School curriculum, the physical appearance of the practicum module is attractive, the practicum activities are easy to carry out because they use simple materials and tools, there is research information that helps students solve problems independently, there is space for writing hypotheses, work procedures, answers to questions and conclusions, and this module as a whole can be designed to improve students' inquiry abilities in carrying out practicum activities in chemistry learning. This research is in line with previous research showing the development of practical guides using inquiry and scientific methods. However, research has not been conducted on its effectiveness in improving students' conceptual understanding and critical thinking skills. Other studies using traditional learning approaches tend to show lower results in active student engagement and the development of problem-solving skills [25, 27]. Compared with the expository method, GI-SL encourages students to actively participate in the investigation process, while the traditional method focuses more on providing information without in-depth exploration.

CONCLUSION

Based on the results obtained, the quality of the developed practicum module is Very Good (SB) with a score of 132.52 and an ideal percentage of 88.3467%, so the module is suitable for use by class XI students of Health Vocational Schools. The results of this research prove that the Guided Inquiry-Scientific Laboratory (GI-SL)- based practicum module development factor provides facilities in the form of a structured guide that encourages students to explore, formulate hypotheses, and analyze data actively. This module facilitates independent inquiry learning while giving clear direction for developing scientific and problem-solving skills. Chemistry teachers and stakeholders are advised to adopt this module. Other researchers are advised to develop Guided Inquiry-Scientific Laboratory (GI-SL)- based practicum modules further, with a focus on various chemical materials and various levels of education. Additionally, further research could explore the effectiveness of this method in improving students' critical and collaborative skills and its impact on long-term learning outcomes.

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