

# Analysis of Biomolecular Practicum Guides According to KKNi Curriculum

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**Abstract**— Practicum guides are one of the important teaching materials. The provision of appropriate practicum guides and in accordance with existing needs is needed, in order to support the learning process of students. This study aims to analyze biomolecular practicum guides used by students of the chemical education program at Universitas Negeri Medan. The method in this research is descriptive analysis, using a practicum guidance analysis questionnaire given to three expert lecturers. The average analysis results obtained are 2.7; 2.81; 2.5. Based on the results of the analysis it was found that biomolecular practicum guides used by students of the chemical education program Universitas Negeri Medan were still not in accordance with the KKNi curriculum, for that in further research it was necessary to develop biomolecular practicum guides that were in line with KKNi curriculum.

**Keywords**— *Practicum Guides; Biomolecular; KKNi Curriculum*

## I. INTRODUCTION

Education is a conscious effort made by the family, community, and government through the activities of guidance, teaching, and or training to realize the learning process so that students actively develop their potential [1]. Given the importance of chemistry in daily life as well as in various sciences, it is necessary to improve the quality of learning chemistry in higher education. The thing to note is how to create learning that is appropriate, interesting, and can make students active according to the KKNi curriculum.

One of the efforts to improve the quality of education is through the provision of quality subject matter. Procurement of quality subject matter can be done through the preparation of quality teaching material [2]. Quality teaching materials must be able to present teaching materials in accordance with curriculum demands, follow the development of science and

technology and be able to bridge learning so that the established competency can be achieved [3].

Implementation of practicum activities in the laboratory requires guidance to make it easier to determine the steps in the practicum. From the results of observations that have been made found several problems in the implementation of practicum [4]. One of them is, practicum guides that are available are not in accordance with the National Standards of Higher Education (SNPT), which basically practicum activities must be able to develop students' scientific learning abilities. Secondly, the approach in practicum has not used a scientific approach or more to the conventional approach, which is giving problems, a list of tools and materials, and work procedures to students [5].

## II. LITERATURE REVIEW

The laboratory is usually defined as: (1) a place equipped for experimental studies in science or for testing and analysis; places provide opportunities to experiment, observe, or practice in the field of study, or (2) the academic period is set aside for laboratory work [6]. Chemical laboratories which include Basic Chemistry, Inorganic Chemistry, Organic Chemistry, and Biomolecular Laboratories are important facilities for education, research, services (services) and quality control. With these four functions, it is clear that the existence of a Chemistry Laboratory in Higher Education is very vital, especially for Universities that have exact Faculty. This is to support the implementation of the Tri Dharma of Higher Education which includes education, research, and community service [7].

Chemistry practicum serves practicum activities and supports students' thesis / final research activities. Complete and adequate equipment especially basic chemical laboratory equipment such as fume hoods, glassware, analytical scales, magnetic stirers, digital ovens, calorimeters and other practicum equipment. It is also equipped with a storage room for equipment and chemicals [8].

The aims of chemical practicum include: (1) As an illustration of the principles in theory; (2) As forming scientific attitude; (3) As a skill development, i.e. so that the practitioner is able and skilled to operate the equipment, handle chemicals, teach experiments and measure chemistry; (4) To gain practical experience in chemistry as a basis for further research in accordance with their respective background expertise [9]. Aside from being a place for conducting student chemistry practicum, chemistry laboratories in universities also function as a place for conducting research, both student research (Final Project) and lecturer research and public service facilities, namely for the general public outside the university itself, both for education and for purposes quality test and others [10].

Practicum guide is a book that is compiled to assist the implementation of practicum which contains the experiment title, objectives, basic theory, tools and materials, and questions that lead to the goal by following the rules of scientific writing [11]. Practicum guides are intended to facilitate and provide information assistance or learning material as a guide for students in conducting practical activities [12].

The function of the practical guide is teaching material that can minimize the role of lecturers, make students more active and gain meaningful knowledge, student gain active thinking and hands-on skills, making it easier for educators to carry out teaching in the laboratory [12]. The structure of the practical guide book is in general the title, objectives, tools and materials, tasks and work steps, supporting information and assessment. Written teaching materials must pay attention to the following: (1) The composition of the display, which involves: easy sequence, short title, clear cognitive structure. Easy language, involves: the flow of vocabulary, the clarity of sentences, the clear relationship of sentences, sentences that are not too long; (2) Test understanding, which involves: assessing through people, check list for understanding; (3) Stimulants, which involve: pleasant or not seen, writing encourages readers to think, test stimulants; (4) Readability, which involves: friendliness to the eyes (the letters used are not too small and easy to read), structured text sequence, easy to read; (5) Instructional material, which involves: the selection of texts, study materials, work sheets [14].

Furthermore, according to Bloom, learning outcomes can be broadly classified into three domains [15]. The three domains are: (1) Cognitive domains regarding intellectual learning outcomes include knowledge, understanding,

application, synthesis and evaluation; (2) effective domain regarding attitudes including acceptance, answers, judgment, organization and internalization; (3) psychomotor domains regarding learning outcomes of skills and ability to act include relaxed movements, basic skills, perception, accuracy and interactive.

The existence of KKNi is expected to change the way of looking at one's competence, no longer merely a diploma but by looking at a qualification framework that is agreed upon nationally as a basis for acknowledging the results of a broad (formal, non-formal, or informal) education that is accountable and transparent. KKNi has been carried out through eight stages, namely the determination of graduation profiles, formulating learning outcomes for study materials, packaging courses, developing curriculum frameworks, preparing lecture plans.

Provision of standard teaching materials can realize a complete learning approach and is expected to master competencies in full, in accordance with the pace of learning. Teaching materials should be arranged so that students are more active in learning activities to achieve competence. Teaching materials developed meet valid, effective, practical criteria and can improve critical thinking skills. The teaching material can be recommended to be reproduced and used in the actual learning process [16].

### III. METHODS

This research was conducted at the Chemical Education Study Program, Department of Chemical Education, Universitas Negeri Medan, Medan City, north Sumatera. The study was conducted with a span of research from May to June 2019.

The population in the study is the lecturer population, where the lecturer population consists of all lecturers who are majoring in chemistry. Furthermore, the sample is part of the population that is the source of actual data in a study [17]. The sampling technique is done by purposive sampling. The sample used to determine the feasibility analysis of the Biomolecular practicum guides in accordance with the KKNi curriculum was 3 chemistry lecturers at Universitas Negeri Medan.

Data to be obtained from this study is the form of initial responses and analysis from experts on practicum guides used by students. Data collection was obtained through a practicum guidance analysis questionnaire using the SNPT standard in accordance with the KKNi curriculum.

Data obtained based on the questionnaire analysis guide practicum refers to the SNPT standard. Score analysis uses average calculation that is by dividing the amount of data values by many data (Sudjana, 2005).

$$X = \frac{\sum X}{n}$$

With;  $\bar{X}$  = average value; x = Number of validator assessment answers; n = number of validators.

In this study, the rating scale used is 1 to 4, where 1 is the lowest score and 4 is the highest score. Determination of the range can be known through the range of high scores minus the lowest score divided by the high score. Based on the determination of the range obtained 0.75 range. The questionnaire data obtained was analyzed with the following steps: (a) Data obtained in the form of a checklist that is summarized in the form of a table. The rating scale used is 1-4 with information; not good, not good enough, good, and very good; (b) Adjust the results of data analysis with the feasibility figures in the table; (c) Draw conclusions from the results of data analysis.

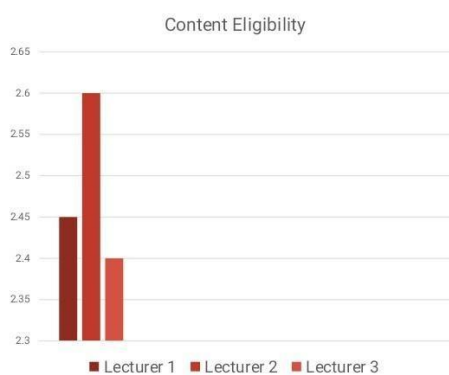
**Table 3.2** Criteria for Practicum Guidance Validation

Average	Variable Criteria
3,26 – 4,00	Very valid
2,51 – 3,25	Valid
1,76 – 2,50	Less valid needs to be revised
1,00 – 1,75	valid needs to be revised totally

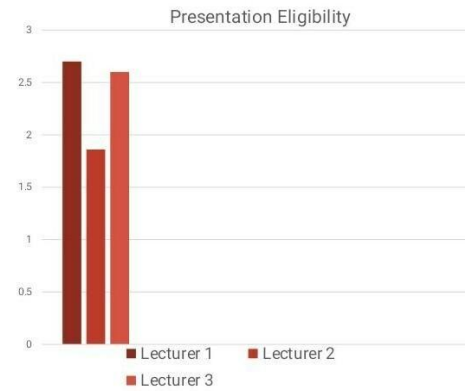
#### IV. RESULTS AND DISCUSSION

The research has been carried out and obtained research results in the form of a questionnaire data on the feasibility of a Biomolecular practical guide book using SNPT instruments in accordance with the KKNi curriculum. The analysis was carried out to determine the feasibility level of the practicum guide in terms of practicum coverage, systematic presentation, containing insight into productivity, stimulating curiosity, developing life skills, practicum guide design, and language used in the practicum guide.

The results of the Biomolecular practicum guidance from each expert lecturer are shown in the following figure.



**Figure 1** content eligibility



**Figure 2** Presentation Feasibility

#### Observation Results

The results of the Biomolecular practical guide book analysis based on the feasibility questionnaire practicum guides include aspects of the feasibility of the content and the feasibility of the presentation. In the feasibility of the content shows that the average value obtained from each expert lecturer is equal to 2.45; 2.6; 2.4. Thus obtained the average value of the feasibility of the content that is equal to 2.48 which means that biomolecular practicum guides are appropriately unfit for use.

Then for the feasibility of the presentation, obtained data from each expert lecturer that is equal to 2.7; 1.86; 2.6 with an average value of the feasibility of the presentation that is equal to 2.38 shows that the practicum guides that are used are still not feasible to use.

As for some things that need to be improved in the aspects of the appropriateness of the contents of the guide are a) the practicum presented is not in accordance with the learning outcomes in the KKNi curriculum; b) the guide book does not present all practicum on every material in odd semester; c) the contents of the guide book do not present the characteristics that can appear in practical activities; d) the guidebook trial procedure is less accurate and can be carried out; e) there is no safety aspect in the book yet; f) publisher A's guidebook has not yet integrated one of the learning models in accordance with the KKNi curriculum; Whereas the feasibility aspects of the presentation that need to be improved are a) the identity of the picture used in the guide book and the source of the image used has not been stated; b) the tools and materials used are not yet clear, wherein the tool guide presented is only in the form of tool names without the number, pictures, and function of the tools used, while the material presented is only in the form of the material used without being followed by the specifications of the material.

## V. CONCLUSIONS

Based on the results of data analysis and discussion, it can be concluded that the implementation is as follows: The results obtained show that the practical implementation have less good criteria are reviewed based on the questionnaire responses of teachers and students. Some aspects that show fairly low percentage is the availability of time, equipment and materials as well as practical guidance, in addition to the motivational aspect of the environment is less supportive practicum.

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