

The Analysis of Contextual-Based Biochemistry Practicum Guidelines

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ABSTRACT

This study aimed to analysis biochemistry practicum guidelines as a supporting in biochemistry learning. The data analysis technique in this research was descriptive analysis and percentage. The instrument used was an instrument analysis questionnaire based on the BSNP (National Education Standards Board) which consisted of a content feasibility test, a language feasibility test, a presentation feasibility test, and a graphic feasibility test. The results of the analysis based on the BSNP biochemistry practicum guidelines are: the content feasibility test is 57.69% (Good enough), the language feasibility test is 79.16% (good), the presentation feasibility test is 69.44% (good), and the graphical feasibility test is 55% (good enough).

Keywords: Research and Development, Practicum Guidelines, Biochemistry and BSNP

1. INTRODUCTION

Practicum is a chemistry learning method that can find facts so that it can increase understanding and mastery of the content (Phelps and Lee, 2003). Practicum carried out by students can increase factual and procedural knowledge so that it easier to understand chemistry learning [2].

One of the efforts made with chemistry learning innovations is outlined in a practicum guideline. Interesting guides such as the use of color, language style according to the subject matter, complete with pictures, illustrations, and sample questions to support the learning process [3]. An innovative practicum guideline contributes to the learning process. Practicum is able to make learning chemistry that does not understand and improve students into the discipline [4].

Teaching materials for practicum guides must meet the criteria in the explanation of safety. Practical guidance is carried out as an in-depth study of chemistry material which will broaden the horizons of experimentation and student activities in the laboratory [5].

Learning chemistry in theory and practicum must be done simultaneously [6]. In general, learning using practicum contributes to the conceptual understanding

of students because it motivates them to participate in the learning process [7]. Practical activities are learning activities that can be done in class or in the laboratory [8].

Practicum carried out by students can increase factual and procedural knowledge and make it easier to understand chemistry learning [9]. The use of laboratory learning strategies creates and increases student motivation, interest, and achievement [10], critical thinking to develop cognitive abilities and skills [11]. Learning is defined as a way to introduce material both actively and designed to help students connect what they already know is expected to learn, and to build new knowledge from the analysis and synthesis of the learning process. Three types of learning scenarios are project-based, goal-based, and demand-oriented [12].

In laboratory work, school students collect in scientific activities ranging from learning through experience and discovery, asking questions, suggesting solutions, making predictions, processing data to explaining through examples, so it is necessary to provide tools and good laboratory management, so that the implementation of chemistry learning can be run to its full potential [13].

Practical activities are learning activities that can be carried out in class or in the laboratory. The use of the

practicum method will be effective if it is supported by the availability of tools and chemicals in the laboratory as well as the skills of teachers in implementing practicum, but in reality learning practicum in schools has many obstacles in its implementation [14].

The challenge that is often found today is finding new ways to stimulate creative abilities and motivate the current generation to have a different orientation from the learning system that is mostly practiced so far. This approach to learning with students as passive recipients of the learning process may not be suitable for the current generation [15-16].

2. METHOD

This study aimed to analyze biochemistry practicum guidelines as support biochemistry learning. The data analysis technique used in this research is descriptive analysis and percentage. The instrument test was an instrument analysis questionnaire based on the BSNP (National Education Standards Board) which consisted of a content feasibility test, a language feasibility test, a presentation feasibility test, and a graphic feasibility test.

Analysis of research instruments including; (1) The learning equipment consists of a syllabus, teaching materials, practicum books and semester learning plans, (2) the data collection instrument is a questionnaire.

The data obtained is based on an analysis questionnaire of the practicum guidebook according to the BSNP with the rating scale used to analyze the practicum manual is 1 to 4. Where 1 is the lowest score and 4 is the highest score. The equation used to calculate the results of filling out the questionnaire is the average calculation suggested [16] can be seen in Table I

Table 1. Practicum guides validation criteria

No	Average	Variabel Criteria
1	3,26 – 4,00	Very valid and no revision
2	2,51 – 3,25	Very valid and no revision
3	1,76 – 2,50	Slightly valid, half revision
4	1,00 – 1,75	Not valid dan full revision total

3. RESULT AND DISCUSSION

The results of the practicum guidelines analysis that has been carried out to analyze and collect data will be followed by the development of innovative practicum guidelines. The next researcher conducted a biochemistry laboratory guidelines analysis in odd semesters, the researcher conducted a feasibility test based on (a) content feasibility, (b) language feasibility, and (c) presentation feasibility, (d) graphic feasibility.

Practical guidelines analysis activities in order to get better biochemistry guidance and different from existing practicum guidelines. The aim is that learning

biochemistry practicum material does not seem weary for lecturers and students so that it can be handle with fun and more efficient practicum activities based on safety at work.

The discussion of biochemistry practicum guidelines analysis results: The results of the research analysis on the content feasibility biochemistry practicum guidelines can be seen in Fig. 1

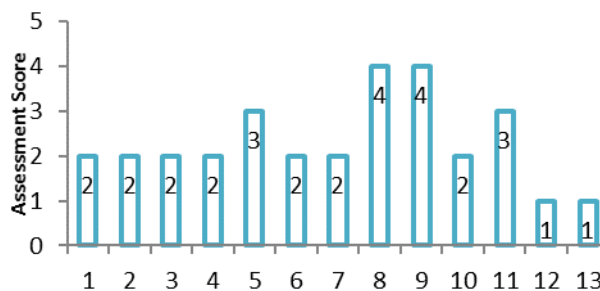


Figure 1 The analysis results of the biochemistry practicum guidelines based on content feasibility

Content feasibility has 13 components, they are, (1) Organization of the subject matter and sub-material sequentially according to the syllabus, (2) Conformity of the sub-material with the subject matter of biochemistry, (3) The material presented at least reflects substance description of the material contained in learning outcomes, (4) The depth of the submaterial in the practicum guidelines is in accordance with the sub-material of the textbook, (5) The depth of the submaterial according to the thinking maturity of students and whether or not the material development is obtained, (6) Connecting science, technology, and life, (7) The suitability of the submaterial in the practicum guidelines with concepts put forward by chemists, (8) Explanation of experimental concepts according to the class level of students, (9) There are learning objectives for each activity, (10) The relationship of concepts related to everyday life, (11) Emphasizing process skills, (12) Integrated contextual learning and (13) Innovative with a nature-based approach, based on everyday life. Based on the results of the assessment, the average analysis of the biochemistry practicum guidelines was 57.69% (Good Enough).

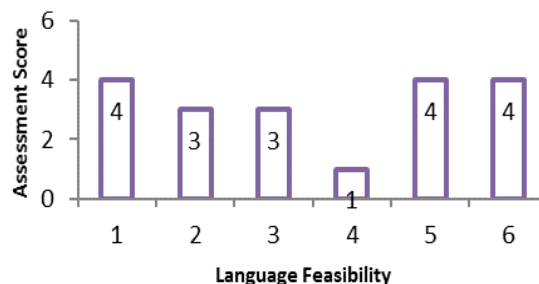


Figure 2 The analysis results of the biochemistry practicum guidelines based on the language feasibility

In the language eligibility criteria, there are seven assessment components consisting of: (1) Conformity with the development of students' thinking, (2) Conformity with the level of students social-emotional development, (3) Clarity of sentences and the level of readability of the practicum guidelines according to: easy-understand sentences, sentences do not have double or figurative meanings, use of communicative language, use standard language, (4) clarity of sentences that resemble an image/illustration and their suitability with the image described, (5) accuracy of aspects of writing module content with Indonesian language rules correct: Consistency of font type, font size, Consistency of using letterforms (italic, bold, and underlined) as markers of important or foreign terms, Conformity of punctuation marks, and (6) Accuracy of aspects of the use of language, terms, and symbols in practicum guidelines with spelling enhanced (EYD) and/or suitability for use as teaching material in the laboratory. Based on the results of the average assessment, the biochemistry practicum guidelines analysis activity was 79.16% (Good).

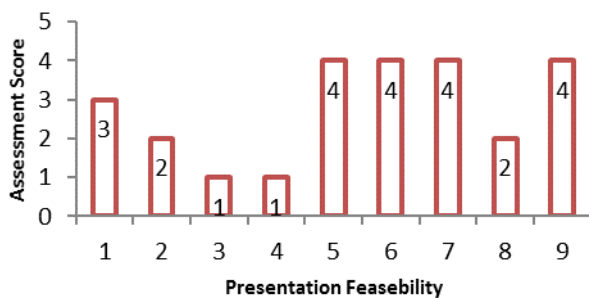


Figure 3 The analysis results of the biochemistry practicum guidelines based on the presentation feasibility

The assessment of the feasibility aspect of the presentation consists of nine components, namely, (1) Completeness of the components in the practicum guidelines, the practical guidelines component, (2) The attractiveness of the module. students, interest in the overall design of the practicum guidelines, (4) Completeness of supporting the presentation in the practicum guidelines, (5) Activities carried out are not dangerous for students, (6) Practicum is easy to implement, (7) Practicum can be in accordance with the allocation of learning time, (8) Provide direct experience, and (9) Questions direct students to draw conclusions. Based on the results of the average assessment, the biochemistry practicum guidelines analysis activity was 69.44% (Good Enough).

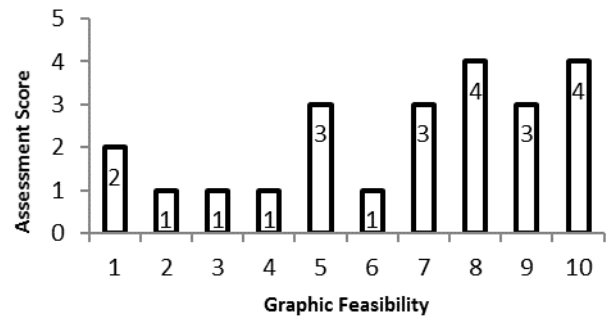


Figure 4 The analysis results of the biochemistry practicum guidelines based on graphic feasibility

The assessment of the feasibility of the practicum guidelines from the graphic aspect contains 10 components, they are, (1) The conformity of the book with ISO standards, A4 book size with a different tolerance from 0-20 mm, (2) The suitability of the material with the content of the book with value, (3) The appearance and consistency of layout on the front and back sides harmoniously has rhythm and unity, (4) The color of the layout is harmonious and clarifies the function, (5) The font size of the book title is more dominant and proportional to the size of the book, the name of the author and publisher with, (6) The color of the book title contrasts with the background color, (7) The placement of the layout is consistently based on the pattern, (8) The separation between paragraphs is clear, (9) The placement of titles, subtitles, illustrations and captions does not interfere with understanding, and (10) Use variations of the letters are not excessive. Based on the results of the assessment, the average biochemistry practicum guidelines analysis activity is 55% (Good Enough).

Assessment of the quality of the biochemistry practicum guidelines uses a questionnaire according to the National Education Standards Agency (BNSP). The basis of the analysis of practicum guidelines is the results of perceptions made by researchers regarding biochemistry practicum guidelines revolving in universities. Analytical activities were carried out according to standards and stipulations and used the validated questionnaire. The aspects are included in the questionnaire assessment of the practicum guidelines quality include content feasibility aspects, presentation feasibility aspects, language feasibility aspects, and graphic feasibility aspects.

The analysis of research on circulating biochemistry practicum guides has been carried out in the laboratory of the State Islamic University of North Sumatra, showing that the results of the analysis of biochemistry practicum manuals odd semester according to the 2013 curriculum show fairly good results on the process of

implementing biochemistry practicum. However, the results of the analysis of this study do not reflect perfect results, because researchers are fully aware that there are still weaknesses in the research, including: (a) the implementation of practicum is only done with limited tests in the biochemical laboratory; (b) equipment facilities in the laboratory when carrying out practicum are not completely adequate; (c) the time available for practicum implementation is still lacking, because it is adjusted to the practicum schedule.

4. CONCLUSION

This research aimed to analyze biochemistry practicum guidelines as supporting biochemistry learning. The data analysis technique was descriptive analysis and percentage. The instrument used was an instrument analysis questionnaire based on the BSNP which consisted of a content feasibility test, a language feasibility test, a presentation feasibility test, and a graphic feasibility test. The results of the analysis based on the BSNP biochemistry practicum guidelines at the State Islamic University of North Sumatra are as follows: the content feasibility test is 57.69% (good enough), the language feasibility test is 79.16% (good), the presentation feasibility test is 69.44% (good), and the graphical feasibility test is 55% (good enough).

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