

## Analysis of Feasibility and Practice of Science Literation Based Practicum Module

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### Abstract

The purpose of this study was to determine the feasibility and practicality test of the science literacy-based practicum module for science learning at SMA Muhammadiyah Kota Langsa. The research method used is education development (Education Research and Development) to determine the quality or feasibility of the module as a practical guide. This practicum module is analyzed the feasibility test by material and media experts consisting of biology and physics education lecturers, while the practicality test uses a questionnaire distributed by science subject teachers. The results showed that the IPA practicum module products analyzed consisted of four categories with a percentage value of 54.99% content feasibility, 60.00% language value, 48.33% presentation value and 66.66% graphics value. Furthermore, a practicality test was carried out which consisted of three aspects, namely the content aspect of 82.85%, the process of the value of 77.14% and the context of the value of 54.28. Based on the values obtained, the science practicum module is feasible and practical to use as a practicum guide.

### Keywords

feasibility, practicality, practicum module, science literacy



## I. Introduction

The development of the 21st century is a development of technological knowledge based on scientific literacy. The development of education is currently happening due to the flow of globalization, especially those related to information technology, which affects student learning in mastery of practicum material. The advancement of technological development cannot be separated from the development of scientific literacy learning. Learning scientific literacy is a part of 21st century learning which is about laboratory learning using e-learning-based practicum modules. Sedana with research opinion according to Rakhmawan, A. (2015) which states that laboratory learning provides positive traits for increasing scientific literacy in Indonesia.

Relevant to the research of Rusilowati, et al. (2016) stated that the progress of science and technology in various countries has increased rapidly in the 21st century. In particular, the term "science" is interpreted as natural science related to efforts to systematically understand various natural phenomena (Rahayuni, 2016). Tang (2015) also explained that literacy is the ability of the participants students in reading, writing, and communicating through activities that have dynamics and changes rapidly then respond to it broadly within social and economic aspects. In line with the opinion of Holbrook & Miiia (2009), that scientific literacy is an appreciation of science by increasing the components of learning in oneself with the aim of having the opportunity to contribute to the social

Environment. McConey (2014) explains that the evaluation process in literacy can include higher order thinking investigations.

Module is one of the concepts of teaching materials that is packaged in a comprehensive and systematic manner, which contains a set of planned learning experiences designed to help student's master specific learning objectives (Daryanto, 2013). Relevant with result research. The research is also relevant to Usmeldi's (2016) opinion that the use of research-based physics learning modules with the scientific approach is effective in increasing the scientific literacy of students. This is supported by the research of Firdaus et al. (2015) which states that the use of biology learning modules is proven to improve student learning outcomes and retention with corrected average results, 53.1% higher learning outcomes compared to the control class and retention in the experimental class. 19.3% higher than the control class.

Modules are teaching materials that are arranged systematically in a language that is easily understood by students, according to their age and level of knowledge so that they can learn independently with minimal guidance from educators. The use of modules in learning aims to enable students to learn independently without or with a minimum of from the teacher. In learning, the teacher is only a facilitator (Ginting, 2020). Ramlan (2018) stated that language is an arrangement of arbitrary symbols possessing an agreed upon significance within a community; furthermore, these symbols can be used and understood independent of immediate contexts, and they are connected in regular ways.

Be related the results of research by Maulina (2014) show that the test for the ability of teachers to do practicum is still low due to their lack of understanding in practicum implementation. This is because the material presented by the teacher is not in accordance with the concept of daily life based on scientific literacy, because many teachers do not master scientific competences. That is why students are bored and inactive in the learning process, even though it is known that practicum learning is closely related to science. In addition, the results of this study are in accordance with the statement of Arisman & Permanasari (2015) which shows that scientific literacy skills can be improved through practicum activities. Based on this problem, feasibility and practicality test was carried out at SMA Muhammadiyah Kota Langsa. The results of this study produce modules that can be used by teachers and students in the process of practicum learning activities.

## **II. Research Methods**

The research method used is take an educational research and development approach (Education Research and Development). The mathematics carried out are (1) site field testing, activity evaluation, and revisions until practical and effective products are obtained / used for education (Thomas, et al., 2013). The subject in the research is a module product which is used as a practicum guide with its object related to the quality of the designed practicum module. Data collection techniques in this study were to distribute questionnaires and practicum module products that were validated by material experts, media, and educators. The assessment from the material and media expert aspect of the feasibility of the practicum module, includes 1) content feasibility; 2) language; 3) presentation, and (4) graphic, whereas in the practicality assessment of the practicum module carried out by educators related to the appearance and clarity of sentences as well as the level of readability based on aspects of scientific literacy. Aini et al (2019) stated that assessment is a process carried out through the steps of planning, preparation of assessment tools, and gathering information through a number of evidence that shows the achievement of student learning

outcomes, management and use of information. The data analysis technique in this study was from product validation using a questionnaire with scalalicer based decision making.

### III. Result and Discussion

In connection with this research, it is in line with the results of research by Maturadiyah & Rusilowati (2015) that of all textbooks analyzed, in general, the scope of the category of scientific literacy as a body of knowledge is 70.94%; science as a way of investigating at 7.08%; science as a way of thinking at 19.08%; and the interaction between science, technology and society by 2.90%. Furthermore, Jusmasari, et al. (2019) explained that The analysis obtained shows that there are four categories whose percentages are analyzed, namely 77.27% content feasibility, 100% language feasibility, 79.16% presentation feasibility, and 95% graphic feasibility, based on this, the chemistry lab manual for class XII semester II is appropriate with the BSNP and fit for use.

Based on the results of the data using a feasibility test consisting of four categories, namely the feasibility of content, language, presentation and graphics. Furthermore, the practicality test based on scientific literacy consists of three aspects, namely aspects of content, process and context. In this regard, it can be explained in Table 1.

**Table 1.** Feasibility of the contents of the science practicum module product

No.	Content eligibility	Class X Science Practicum Module	Class XI Science Practicum Module
1.	The content of the practicum module is very much in accordance with the KI and KD of science learning	3	3
2.	The contents of the practicum module are very suitable for the indicators and learning objectives	3	2
3.	The contents of the practicum module have instructions for use	4	4
4.	The content of the practicum module material is according to everyday life	3	3
5.	The contents of the practicum module are practice questions and answers	2	2
6.	Fill in the assessment rubric practicum module	2	2
Amount		56.66%	53.33%

Based on the data in Table 1, the assessment of experts in the feasibility test of the science practicum module product. The component of the feasibility of the contents of the class X science practicum module with a value of 56.66% is declared C (sufficient) while the class XI science practicum module has a value of 53.33% C (sufficient). The results of this study were supported by an opinion regarding the appropriateness of the contents of the practicum module according to the KPS-based genetics practicum guideline research which was categorized as "very good" and suitable for use in genetics practicum in the laboratory with an average percentage of 88.2% (very good) by material experts. , and the average percentage is 88.3% (very good) according to design experts (Lauren, et al., 2016). This data can be seen in Table 2.

**Table 2.** The language of the science practicum module product

No.	Language	Class X Science Practicum Module	Class XI Science Practicum Module
1.	The science practicum module can be read by users well	3	3
2.	The science practicum module contains clear information	4	3
3.	The practicum module uses language rules that are in accordance with the rules of the Indonesian language	4	3
4.	The practicum method uses language effectively and efficiently (clear and concise)	2	2
Amount		65%	55%

Based on the data in Table 2, the product feasibility test from the linguistic aspect consists of a class X science practicum module with a value of 65% stated as B (good) while class XI with a value of 55% C (sufficient). This is in line with Fadillah, et al. (2017) that the language aspect has a high average score in the study of material experts and shows one of the good indicators of the quality of a book (module) being developed. Product presentation data can be seen in Table 3.

**Table 3.** IPA practicum module product presentation

Serving	Class X Science Practicum Module	Class XI Science Practicum Module
1. The practicum module provides very clear objectives and performance indicators	3	3
2. The concepts in the practicum module are presented from easy to difficult, from simple to complex, or from informal to formal, thus encouraging students to be actively involved	3	3
3. The practicum module presents prerequisite material to precede the main material related to the prerequisite material concerned	2	3
4. The material in the practicum module provides motivation to students	2	2
5. The material presented in the practicum module is interactive (provides a stimulus and demands student response)	2	2
6. The material presented in the practicum module contains very complete information	1	2
Amount	43.33%	53.33%

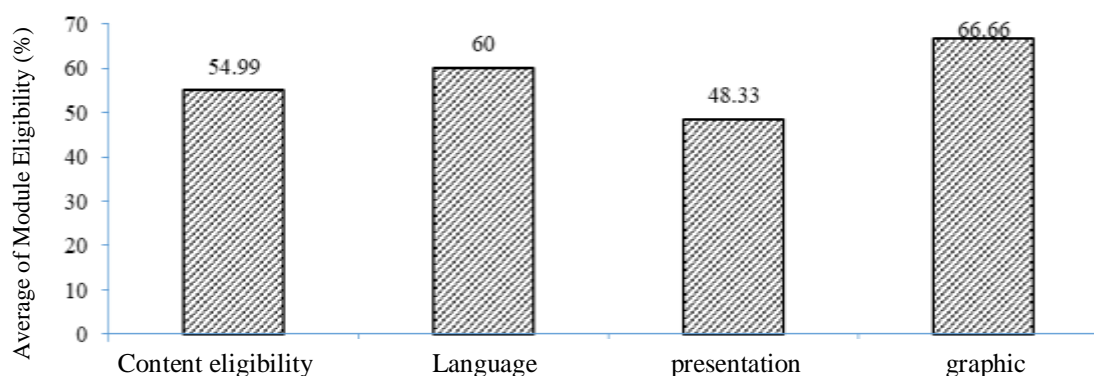
Based on the data in Table 3, the assessment of the experts in the feasibility test of the science practicum module product. The component of the class X science practicum module with a value of 43.33% is declared C (sufficient), while the class XI science practicum

module has a value of 53.33% C (sufficient). The presentation in the feasibility of this research module can be linked from the results of research by Rahmadhania, et al. (2017), that the module that presents an image will make it easier for students to understand the content of learning material. In connection with the opinion of the feasibility of the dish, the results of the assessment of the graphic aspects are presented in Table 4.

**Table 4.** The product of the science practicum module

No.	Graphics	Class X Science Practicum Module	Class XI Science Practicum Module
1.	The type and size of the letters used in the practicum module are appropriate for the user	3	3
2.	The practicum module presents the composition and size of layout elements (titles, page numbers / folio	4	3
3.	Describe the content / material teach and reveal object character	4	3
Amount		73.33%	60%

Based on Table 4, the assessment of experts in the feasibility test of the science practicum module product. The graphic component of the class X science practicum module with a value of 73.33% is declared B (good), while the class XI science practicum module has a value of 60% C (sufficient). The assessment of the results of this graphic aspect is related to the research of Sukardiyono & Wardani (2013) showing the results obtained in the graphic aspect can be categorized as high with a value of 0.70, it is stated that there is an increase in student achievement in practicum implementation.



**Figure 1.** Eligibility of the science practicum module

Regarding the data in Figure 1, it can be explained in detail that 1) the feasibility of the content of the value of 54.99% is stated as C (sufficient); 2) language value of 60.00% C (enough); 3) presentation of the value of 48.33% C (sufficient), and 4) the graphic value of 66.66% B (good). The results of the four components, the graphic aspect got good results with a value of 66.66%. The results obtained from Figure 1 is an assessment of the feasibility test for the practicum module. The percentage value statement from the feasibility test of the practicum module in this study is supported by the results of research by Furqan, et al. (2016) showing that the application of inquiry-based practicum modules that are well designed or

meet the eligibility criteria can not only improve students' science process skills but can also improve their learning outcomes.

Based on the explanation above about the feasibility test of the practicum module, which will serve as a guide for the implementation of the practicum. The results of the data will be followed by a practicality test in the form of a questionnaire given to science subject teachers in Table 5.

**Table 5.** Test the practicality of the questionnaire content of the science practicum module based on scientific literacy on the content aspect

No	Content	Very Practical	Practical	Enough Practical	Less Practical	Very less Practical
1.	Does the practicum module have Basic Competencies and Core Competencies	4	3	1	1	0
2.	Is the practicum material in accordance with the indicators and learning objectives	5	3	1	2	0
3.	Is there an assessment rubric in the practicum module	5	3	1	0	0
Amount		14	9	3	3	0

Based on the results of the values found in Table 5 in the practicality test assessment on the content aspects of the questionnaire statement, the criteria that appear are very practical. According to Hayat & Yusuf (2011) PISA determines the criteria for selecting science content, namely: relevant to real-life situations, the concept is estimated to be relevant at least a decade from now, and is related to process competence. Furthermore, the questionnaire results data on the process aspect are presented in Table 6.

**Table 6.** Test the practicality of the questionnaire content of the science practicum module based on scientific literacy in the process aspect

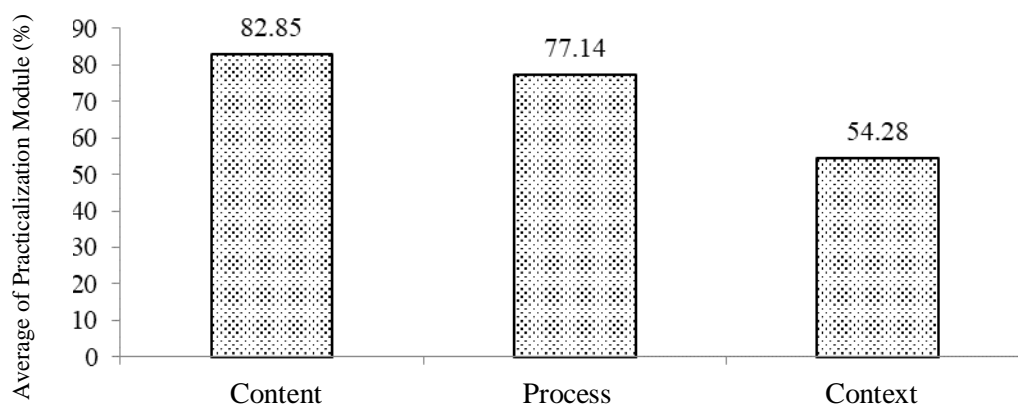
Process	Very Practical	Practical	Enough Practical	Less Practical	Very Less Practical
1. Is there a column for observing the results of the experiment in the practicum module	S3	4	1	1	0
2. Is it found in the practicum module material in everyday life	2	3	2	2	0
3. Are there any sentences in the contents of the practicum module to conclude the results of the practicum activities	4	4	1	0	0
Amount	9	11	4	3	0

Table 6 illustrates that the distribution of questionnaires answered by teachers as educators in science subjects by conducting practicality tests on the aspects of the process, then very practical criteria that often arise. This is relevant to Purwanto, et al. (2013) that inquiry ability can be accessed through investigative ability which is an aspect of the scientific process, so that learning is more meaningful and able to improve the process and learning outcomes. Based on this statement, data related to context aspects are presented in Table 7.

**Table 7.** Test the practicality of the questionnaire content of the science practicum module based on scientific literacy in context aspects

Context	Very Practical	Practical	Enough Practical	Less Practical	Very Less Practical
1. Is the implementation of the practicum in accordance with the practicum module material	6	1	0	0	0
2. Is the practicum material difficult to implement	2	3	0	0	0
3. Are there any obstacles in the implementation of practicum	4	2	1	0	0
Amount	12	6	1	0	0

Table 7 shows that in the context aspect of the five criteria obtained very practical criteria that often arise. This is in line with the research of Suharyadi, et al. (2013) stated that it shows that textbooks are easy to understand by students because most students understand acid and alkaline subjects (56% of students' correct answer scores) from the results of the questionnaire showing that the textbooks developed have content conformity with the curriculum, material presentation, and readability the good one. Furthermore, the data on the percentage average value of these three aspects is shown in Figure 2.



**Figure 2.** The practicality of the science practicum module based on scientific literacy

The results showed that the three aspects were related to the 5 criteria in the practicality test, namely 1) very practical; 2) practical; 3) quite practical; 4) less practical; 5) very impractical. The number of statements from the practicality questionnaire was 9 items based on scientific literacy, namely 1) the content aspect with a value of 82.85% was stated to be very practical in relation to the questionnaire from the content of the content aspect-based practicum module; 2) the process aspect with a value of 77.14% is stated to be practical related to the questionnaire of the content of the process aspect-based practicum module; 3)

context aspects with a value of 54.28% are stated to be quite practical in relation to the questionnaire of the contents of the context-based practicum module. Thus it can be stated that it is very practical, meaning that it is easy to understand the content of the practicum module for teachers and students.

In line with the research results of Muniarti, et al. (2018) that the development of science process skills-based practicum instructions from the validator assessment of the resulting product is in the very good category, while from the results of trial use or limited use and further trials the product is in the easy category. Likewise, the results of statistical tests at a significance level of 0.05% showed a value of  $1.88 > t_{table} 1.71$ , it can be concluded that the application of an open ended-based practicum module on dynamic fluid material can significantly increase the creativity of students (Ayel et al, 2017).

#### IV. Conclusion

Based on the results of research on the feasibility test of the science practicum module, it shows that the science practicum module products analyzed consist of four categories with a very valid graphic aspect percentage value with a value of 66.66% categorized as a practicum module declared feasible to be used as a practicum guide while the practicality test is by distributing a questionnaire for teachers with a value of 82.85% in the content aspect was stated to be very practical, meaning that it was easy to understand the content of the practicum module for teachers and students.

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