



Development of a Practicum Module Oriented to Chemoentrepreneurship with Qur'an and Hadist Insight on Colloidal System Material

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Abstract

This study aims to develop a practicum module oriented to Chemoentrepreneurship with Qur'an and Hadith insight on colloidal system material for Class XI SMA/MA that is valid and practical. This study used the Research and Development (R&D) research method with the 4-D development model (define, design, develop, and disseminate). Data for the defining stage was collected using an instrument in the form of an interview sheet. The interview sheet was filled in by the chemistry teacher. Data for the development stage was collected with instruments in the form of validity sheets and practicality questionnaires. Validation were completed by chemistry lecturers and chemistry teacher. Practicality questionnaire sheets were completed by the students as respondent. Data from validity and practicality instruments were analyzed using descriptive quantitative methods, with the percentage formula. The results showed that the practicum module oriented to Chemoentrepreneurship with Qur'an and Hadith Insight on the material of the colloidal system of class XI SMA / MA was categorized as valid with a percentage of 87.79%. In addition, the practicum module oriented Chemoentrepreneurship with Qur'an and Hadith insight on colloidal system material has met the practical criteria with the results of the student response questionnaire 86.80%. Thus, it is known that the practicum module oriented Chemoentrepreneurship Insightful Qur'an and Hadith on colloidal system material class XI SMA/MA has been valid and practical. The results of this study indicate that the practicum module developed can be used as one of the learning resources for students.

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INTRODUCTION

The teaching and learning process is an inseparable part of efforts to improve human resources. There is an important role of educators in the learning process that not only teaches subject matter, but there are values that can be sampled by students. The success of learning can be seen from the learning process applied in the classroom with the output in the form of the value and attitude of students. Therefore, educators or teachers are expected to be able to create a conducive climate so that learning activities can be carried out effectively and students have enthusiasm and interest in learning (Winarto, Syahid, & Saguni, 2020).

In the implementation of learning, there are teaching materials that are commonly used as teaching materials in the classroom and teaching materials in the laboratory. Teaching materials commonly used in classroom implementation are textbooks, learning modules, and student worksheets (Ilahi, Mawarnis, & Herman, 2023). Meanwhile, what is used in implementing learning in the laboratory is a practicum module. The practicum module is one

of the teaching materials that can be used as a facility for delivering objectives in the learning process. Practicum modules can be interpreted as teaching materials that are systematically designed based on scientific principles and principles for the benefit of practicum activities. Practicum implementation is applied in science learning activities, one of which is chemistry learning. Practicum in chemistry learning aims to prove the theories obtained in chemistry learning. The practicum module functions as a handbook to help students when carrying out the practicum process (Samsu, Mustika, Nafaida, & Manurung, 2020).

The implementation of practicum activities in addition to the availability of teaching materials, ideally practicum activities can run well if adequate tools and materials are available. However, in reality, in some schools the availability of tools and materials is the main obstacle to the non-implementation of practicum activities. Monotonous learning activities cause a lack of interest and participation of students in the learning process so that it affects learning outcomes (Kusuma, Hakim, Anwar, & Junaidi, 2021; Mawarnis, Maiyena, Roza, Rahman, & Al-She'irey, 2022).

Based on the results of interviews from one of the high schools in Koto Singkarak, it was stated that in carrying out learning process activities, practicum implementation could not be carried out due to online learning conditions, and to overcome this, chemistry teachers only gave assignments to watch learning videos or practicum videos. In addition, laboratory conditions that have limited tools and materials are also an obstacle so that practicum implementation cannot be carried out. When viewed from the guide or teaching materials used only use textbooks and the unavailability of practicum modules. Based on these problems, it has an impact on the interest and learning outcomes of students, this can be seen in the results of the daily test scores. As many as 75% of students are not complete, while the percentage who are complete is only 25%. For this reason, researchers feel the need to develop teaching materials in overcoming the availability of teaching materials, namely practicum modules. Practical modules are teaching materials used by students so that they can learn independently or with the guidance of a teacher who is systematically designed on one particular material. The advantage of practicum modules as teaching materials is that students find it easier to carry out practicum activities with work steps that have been systematically arranged (Rohman & Lusiyan, 2017; Samsu et al., 2020).

To overcome the limitations of materials and tools in the implementation of practicum, it is necessary to develop a practicum module. Practicum modules are developed using a learning approach, namely Chemoentrepreneurship. Chemoentrepreneurship is chemistry learning with an approach developed so that students directly relate to real objects or phenomena in the surrounding environment that can be a business for students (Farkhati & Sumarti, 2019). The advantages of chemoentrepreneurship (CEP) oriented practicum modules are that students can utilize materials and tools around students to understand the material and can increase interest and enthusiasm for students in the learning process. In the learning process, teachers or educators are not only focused on the transfer of knowledge, but also on improving the spirituality of students. For this reason, in balancing knowledge in the learning process, practicum activities can be integrated with the Qur'an and Hadith in accordance with the Core competencies (KI) and Basic competencies (KD). Practicum in chemistry learning that can develop students' spiritual character, in the form of character related to awareness of the relationship with God Almighty (Sari & Vebrianto, 2017).

It is important to develop a practicum module that is integrated with Chemoentrepreneurship and Quran verses and hadith. In addition to being a supporting teaching material for practicum, by integrating Chemoentrepreneurship, students will develop practical skills that are relevant to the real world. In addition, involving the verses of Al-Quran and hadith in the practicum module shapes the character of high quality and ethical students, and encourages

creativity, problem solving, and independence. Thus, the development of a practicum module that incorporates Chemoentrepreneurship and Quranic verses brings holistic and relevant benefits to students, equipping them with knowledge, skills, as well as strong character to face challenges and opportunities in an ever-evolving world.

The development of teaching materials with the Chemoentrepreneurship approach has been supported by several studies, including stating that the module based on chemo-entrepreneurship oriented for chemistry learning as valid, practical and effective for use in grade XI students on the odd semester (Arifin, Latisma, & Oktavia, 2018). The buffer solution-oriented modules CEP is effective and well received by the user so that it can be used as a source of student learning that can improve understanding of concepts and foster interest in entrepreneurship students (Wikhdah, Sumarti, & Wardani, 2015). From several studies that have been conducted, most of them develop teaching modules, but in this research, a practicum module will be developed.

In addition to the CEP approach, the practicum module is also insightful from the Quran and hadith. The integration of cognitive learning with spiritual learning is needed to realize the government's expectations in accordance with the demands and goals of 21st century education (Mujala, Reza, & Puspita, 2022). The development of teaching materials with Qur'an And hadist insight the has been supported by several studies, which states that the android-based augmented reality learning media integrated with islamic values on electrolyte and non-electrolyte solution materials is valid and practical (Herman, Rahmi, Hanifan, & Herman, 2022). However, in that study the learning material was electrolyte and non-electrolyte solutions, in this study conducted on colloidal system material.

Colloidal system materials have significant relevance in entrepreneurial activities because they have a variety of practical applications in various industries and business fields. The special properties of colloids allow the formation of special suspensions, emulsions or solutions that differ from the substance in its pure state. Knowledge of these properties enables entrepreneurs to develop specialized products such as jams, jellies or high-quality milk-based drinks. Based on Urfa and Sanjaya (2019) research, CEP-oriented colloid module that can foster entrepreneurial interest. Through linking the scientific concepts of colloids with relevant Quranic verses and Hadith, students can understand how science and religious teachings complement each other. This integration also motivates students' curiosity, as the Quranic verses encourage them to contemplate the signs of Allah's greatness in natural phenomena. In addition, there is no research on the development of practicum module oriented to chemoentrepreneurship with qur'an and hadist insight on colloidal system material.

Based on these observations, researchers conducted research as well as problem solving about "Development of a Practicum Module Oriented to Chemoentrepreneurship with Qur'an and Hadist Insight on Colloidal System Material".

METHOD

This research is a development research or Research and Development (R&D). In this study using the 4-D model from Thiagarajan which consists of define, design, develop and disseminate stages (Thiagarajan, 1974). This research was only conducted up to the develop stage. The definition stage is carried out to determine the initial conditions in the field and determine what teaching materials will be developed, by: (1) front-back analysis (2) learning objective analysis and material analysis. The design stage is to design a prototype of the practicum module. The development stage (develop), contains activities to realize a final product in the form of a practicum module after passing the validation and practicality stages.

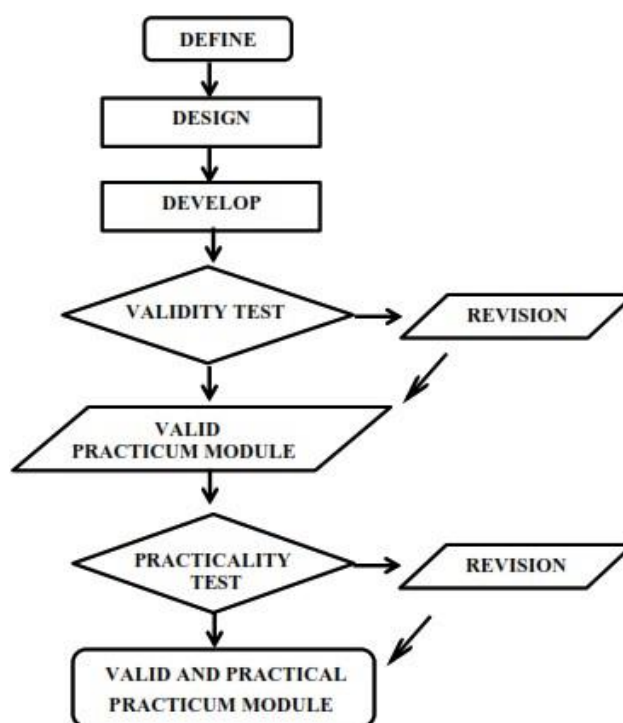


Figure 1. Research procedures

This research was conducted at SMAN 1 X Koto Singkarak with the test subjects of students in class XI IPA 3. Data collection instruments in the form of validity sheets assessed by three validators and practicality questionnaires were filled in by 24 students and 1 chemistry teacher. Data analysis of the results of the validity and practicality instruments using the percentage formula:

$$P = \frac{\text{score of each item}}{\text{maximum score of each item}} \times 100\%$$

Table 1. Scoring Categories

Categories	Score
Not valid/practical	0%-20%
Less valid/practical	21%-40%
Fairly valid/practical	41%-60%
Valid/practical	61%-80%
Highly valid/practical	81%-100%

Modification from Riduwan (2008)

RESULTS AND DISCUSSION

This research uses the 4D development model from Thiagarajan which consists of several stages, namely, define, design, development and disseminate.

Define Stage

The define stage is the stage that the author does to find out the problems that exist in the field and find solutions to these problems. The define stage aims for the author to get a general description of the implementation of the practicum conducted at SMAN 1 X Koto Singkarak.

Front-Back Analysis Results

Interview with chemistry teacher

Based on interviews with chemistry teachers at SMAN 1 X Koto Singkarak, researchers obtained information that learning on colloidal material was often not carried out properly due to colloidal material being the last material in KD 4.14, so that learning time was cut for exam preparation and others. The chemistry teacher of SMAN 1 Koto Singkarak also said that not all material in class XI IPA in the learning process can be practiced, this is due to the limitations of practicum tools and materials that are still limited. This limitation causes teachers to only use makeshift practicum guides such as LKPD on certain materials.

During the learning process the media used is still limited so that learning is less varied and the teaching materials used during learning are limited to LKPD and package books. Package books and LKPD used during learning have not been integrated with Islamic values in accordance with the core competencies in the 2013 curriculum. When researchers explained the Chemoentrepreneurship approach in the practicum module, educators were interested. However, time constraints and others cause educators have not been able to develop teaching materials. Based on the information obtained by the researchers, to optimize practicum activities based on these problems, the researchers designed practicum module Chemoentrepreneurship-Oriented material with Al-Qur'an and hadith insights on colloidal system material that can be used by teachers or students as teaching materials. With this practicum module oriented chemoentrepreneurship, students are expected to understand the material and actively participate in practicum activities.

Student interview

Interviews were conducted with several students of class XI IPA regarding the learning implementation process. Based on the results of interviews with several students obtained information that in the implementation of learning media used by educators is still limited which resulted in less free students. In addition, when researchers explained the practicum activities with the Chemoentrepreneurship approach, students felt interested in practicum activities that not only prove the theory but can be an economically valuable business. Learning conditions that are still limited and practicum activities carried out only by watching practicum videos without trying it directly make them feel bored. In addition, students also conveyed that they were enthusiastic about doing practicum activities because they felt bored when learning material and not interspersed with practicum activities. Learning conditions that are still limited make students have to watch practicum videos to understand learning which they find boring without trying directly.

Learning objective analysis and material analysis

Based on the syllabus of chemistry class XI semester 2. Core competencies and basic competencies of chemistry class XI colloidal system material has two basic competencies, so the material in the practicum module refers to these basic competencies.

From the results of the interview obtained information that the problems or obstacles faced in the learning process are the limitations of teaching materials. The teaching materials used are not in accordance with the demands of the 2013 curriculum, where in the 2013 curriculum one of the core competencies suggests that learning materials be integrated with the religious values that students believe in, in this case Islamic religion. The integration of education with religion and technology has implications for the social religion of students who foster mutual respect and appreciation in differences and religious beliefs, and realize the relationship between religion and science that does not conflict (Arifudin, 2016). Based on the interview with students, information is obtained that the implementation of practicum is still constrained because the tools and materials for practicum activities are still limited and the practicum guides used are only in the form of LKPD and the unavailability of practicum

modules so that learning tends to be monotonous and less varied. Monotonous and less varied learning can cause students not to actively participate in the learning process. This will have implications for student interest and learning outcomes (Prasetyo, 2020). Therefore, to solve one of the problems found at the school, the researcher developed a practicum module oriented to Chemoentrepreneurship with Al-Qur'an and hadith insights on the material of the colloidal system class XI SMA / MA.

Design Stage

At the design stage is done to design a prototype of the practicum module oriented Chemoentrepreneurship insightful Al-Qur'an and Hadith on colloidal system material class IX SMA / MA. Then after the design of the practicum module is completed, then design the research instrument. The practicum module with the Chemoentrepreneurship approach was developed to overcome the limitations of tools and materials, so that practicum activities can still be carried out with tools and materials found around students.

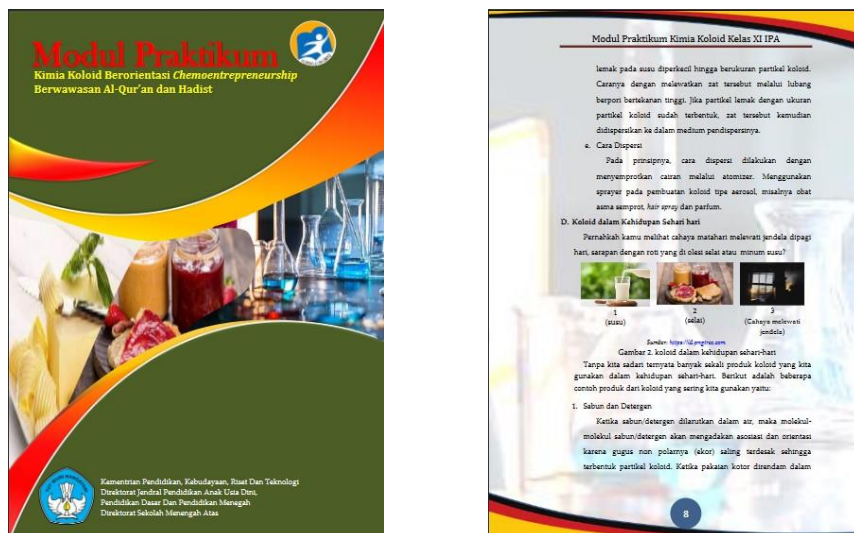


Figure 2. Cover and Material

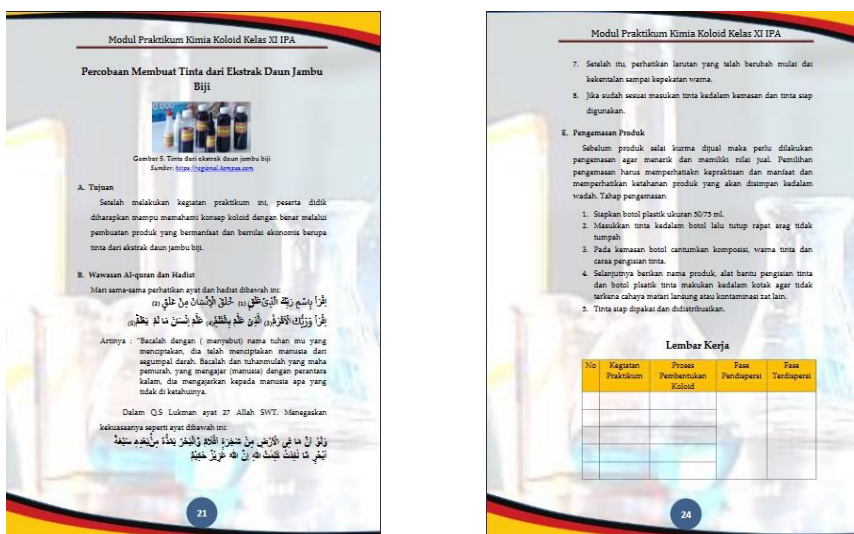


Figure 3. One of the practicum oriented to chemoentrepreneurship with the insight of the Qur'an and Hadith

Develop Stage

Validation Test Results

Table 2. Validation Test Results

No	Validation Aspects	Sum	Max Score	%	Remarks
1	Content Feasibility	94	108	87.0	Highly valid
2	Presentation Feasibility	77	84	91.6	Highly valid
3	Linguistic Feasibility	62	72	86.1	Highly valid
4	Graphics Feasibility	62	72	86.1	Highly valid
	Total	295	336	87.7	Highly valid

Based on table 2, the percentage of content feasibility is 87.0 % with a highly valid category, the percentage of presentation feasibility obtaining a value of 91.6% is categorised as highly valid, linguistic feasibility obtaining a percentage of 86.1% is categorised as highly valid and for graphics feasibility with a percentage of 86.1% is categorised as highly valid. Based on the table above, the overall percentage with a value of 87.7% is included in the highly valid category.

Practicality Test Results

Table 3. Practicality Test Results

No	Practicality Aspect	Sum	Max Score	%	Remarks
1	Ease of use	332	384	86.4	Highly practical
2	Display	432	480	90.0	Highly practical
3	Learning Material	233	288	80.9	Practical
4	Language	163	192	84.8	Highly practical
5	Benefits	90	96	93.8	Highly practical
	Total	1250	1440	86.0	Highly practical

Based on table 3, the ease of use is 86.4% categorised as highly practical, the display gets a percentage of 90.0% categorised as highly practical, the learning material with a percentage of 80.9% is categorised as practical, the language with a percentage value of 84.8% is categorised as highly practical, and the benefit with a percentage value of 93.8% is categorised as highly practical. Based on the table above, the overall percentage obtained with a value of 86.0 % is categorised as highly practical.

The module that has been designed is tested for validity and practicality to produce a valid and practical practicum module. The validation test process of the practicum module oriented Chemoentrepreneurship with Al-Qur'an and hadith insights on colloidal system material class XI SMA / MA involved three validators consisting of two chemistry lecturers and one chemistry teacher. The practicum module that has been validated by three validators as a whole obtained highly valid results with a percentage above 87.7%. The validation aspects of this practicum module include content validity, presentation feasibility, language and others.

A good practicum module that is suitable for use must include material, tools and materials, and experimental procedures. Based on the results of the validity test of the practicum module oriented Chemoentrepreneurship with Al-Qur'an and hadith insights on the material of the colloidal system class XI SMA / MA in the aspect of content feasibility which includes the completeness of the material, the accuracy and suitability of the selection of Al-Qur'an and hadith verses and others get a percentage of 87% which can be interpreted as highly valid. This is because the material in the practicum module is presented simply and the examples used are based on phenomena around students so that they are easy to understand.

In addition, the material presented is in accordance with the description of competencies and there are insights from the Qur'an and hadith before practicum activities (Sari & Vebrianto, 2017).

The results of the validity test for aspects of the feasibility of presentation obtained a percentage of 91.6%. This is because the presentation of the material and the stages of practicum activities are clearly described and the combination of attractive images and colors. Aspects of presentation feasibility include the adequacy of the presentation in this case the experimental procedure is explained coherently, supporting the presentation of material through the Chemoentrepreneurship approach, presenting learning through the insights of the Qur'an and hadith so that it helps achieve learning objectives.

The linguistic aspect, obtained a percentage of 86.1% with a highly valid category. This is because the language used pays attention to the rules of the general guidelines for Indonesian spelling. The use of language that is interactive, logical and in accordance with the development of students can make it easier for students to understand the subject matter. (Anggoro, 2015)

The results of the graphics aspect obtained a percentage of 86% with a highly valid category. This is because the practicum module developed is designed as attractive as possible with a combination of attractive images and colors. Picture elements can increase students' interest in reading (Apriliani & Radia, 2020). This display aspect includes cover design and practicum module design. A good practicum module if it is in accordance with the characteristics of the module, which includes material that supports the achievement of learning competencies, is also equipped with the presentation of images and experimental procedures.

After the practicum module is declared valid, then the practicality test is carried out. The results of the practicality test of the practicum module oriented Chemoentrepreneurship with Al-Qur'an and hadith insights on the material of the colloidal system class XI SMA / MA were obtained through filling out the response questionnaire of students and teachers. In this study the research subjects were students of class XI IPA 3 totaling 24 people and chemistry teacher SMAN1 X Koto Singkarak. The overall practicum module practicality results obtained a percentage of 86.8% with a highly practical category. The practicality of a practicum module product is said to be practical at least assessed from two aspects, namely, aspects of ease of use and benefits (Dewara & Azhar, 2019).

The ease of use aspect obtained a percentage of 86.4% with a highly valid category. This is because the developed practicum module provides an explanation of material that is easy to understand and each experimental procedure in practicum activities is explained in stages so that students can carry out practicum activities with a minimum accident rate. Practical modules are teaching materials designed so that laboratory activities run well, learning objectives are achieved and reduce the risk of accidents during practicum activities (Samsu et al., 2020).

The test results of the benefits aspect have a percentage of 90% with a highly valid category. This is because the Chemoentrepreneurship approach in the practicum module makes students able to carry out practicum activities to understand, prove the theory learned and produce a useful product. Chemoentrepreneurship is a chemistry learning approach that utilizes tools and materials or phenomena around students to make an economically valuable business (Farkhati & Sumarti, 2019). In addition, the insights of the Qur'an and Hadith that explain the benefits of the materials used during practicum are an added value for students.

The overall test results of the validity and practicality of the practicum module oriented to Chemoentrepreneurship with Al-Qur'an and Hadith insights on colloidal system material for

class XI SMA / MA each obtained a percentage of 87.7% (highly valid) and 86.8% (highly practical). The effectiveness test and disseminate stages have not been carried out due to limited resources such as time, funds, and abilities.

CONCLUSION

Based on the analysis of the research results, it is concluded that the practicum module oriented to Chemoentrepreneurship with Al-Qur'an and Hadith insights on colloidal system material developed has a valid and practical category. Therefore, this practicum module can be used as one of the learning resources.

RECOMMENDATIONS

This research was conducted until the development stage, where at this stage the validity and practicality tests were carried out, for further research it is recommended to conduct an effectiveness test and carry out the disseminate stage.

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