

Development of Spiritual Values Integrated Chemistry Practicum Guide for MA Students in Class XI Odd Semesters

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Abstract. This study aims to find out the feasibility level of the integrated spiritual chemical practicum guide to the reaction rate material developed based on BSNP. This research is research and development research. The development model used is the Addie model which is limited to 3 stages, namely analysis, design, development. Validation subjects consist of expert validators, namely 2 lecturers at Medan State University and 2 chemical teachers. The results of the study obtained aspects of content feasibility of 94.6%, language feasibility aspects of 91.6%, the feasibility aspect of presentation of 94.6% and the feasibility aspect of crafters of 95%. So that the average feasibility of 93.95 % with the criteria is very good or feasible.

Keywords: Development, Integrated Practicum Guide Spiritual Values, Spiritual Values

1 Introduction

Chemistry is a science that is mostly considered abstract, because students cannot see the real concepts they learn. For this reason, efforts are needed to improve the chemistry learning process. The results of the study show that one of the important accesses to education in improving student learning outcomes requires supporting innovation. One of the efforts to improve the quality of education is through the procurement of quality subject matter. quality learning to improve chemistry knowledge with practical activities[1]. The implementation of the practicum that requires a practicum guide, where the practicum guide is used to make it easier to find practical steps. In addition, the practicum guide must also be able to develop scientific learning abilities and critical thinking skills of students[2].

From the results of observations that have been made, there are still many problems found in the implementation of the practicum. First, the students' skills are not good and the available practicum guides are not in accordance with the 2013 curriculum. Second, the practicum approach used today is a conventional practicum approach. Similarly, in the implementation of practicum in the laboratory, most students only do what they are told without knowing the purpose and meaning of the material being practiced. Another problem that is often encountered is that some teachers still find it difficult to teach chemistry, especially in teaching practicum in the laboratory. There are still many teachers who only teach theory

without doing practical work that should be done based on the syllabus. In order for learning activities to be more interesting and to train skills and attitudes in learning, it is necessary to develop a chemical practicum guide that is in accordance with the 2013 curriculum.

According to (Depdiknas, 2010) the 2013 curriculum consists of two main competencies, namely core competencies and basic competencies. Core competence-1 (KI-1) for core competence of spiritual attitude, core competence-2 (KI-2) for core competence of social attitudes, core competence-3 (KI-3) for core competence of knowledge, Core competence-4 (KI -4) for core competency skills[3]. Of the four competencies above, spiritual competence is a very important competency for students. Spiritual competence is a religious value, in other words, a person's thoughts, words and actions must be based on divine values or based on religious teachings. With the spiritual competence, students are expected to be able to become human beings who have noble character and are obedient to the religious values of their teachings.

In the implementation of education in Indonesia, it is usually only oriented towards the goal of making students human beings who are knowledgeable, especially cognitive knowledge, while the spiritual values of students do not receive attention from educators. some of the factors that cause it are 1) the apathy of science teachers towards religion, some teachers do not like to talk about science and religion because they are considered two very different things, different, where religion begins with "belief" while science begins with "unbelief". 2) Some teachers think that science is value-free. 3) In general, thinkers, planners, curriculum implementers, especially teachers, are unable/sufficient to understand how to prepare and teach science material based on religious moral values that can lead students to become believers and devoted to God Almighty. This is because they also never get it during school. 4) Very limited references, either in the form of books or experts that can be used as references or models in moral-based science learning that can lead students to become possible believers and devoted to God Almighty[4].

In connection with the inclusion of a character education curriculum in the school curriculum and one of the goals of education, it is necessary to think about strategic efforts to instill character education related to the competence of spiritual attitudes to students. Therefore, it is very important to make efforts to create a chemistry practicum guidebook that can include religious elements in chemistry learning so that it can raise questions about how chemistry learning can contribute to the achievement of faith and piety to God Almighty while chemistry learning (science) sterile from religious values.

According to Darmana (2014)that presenting the spiritual aspect in teaching materials will not reduce the quality of the scientific level of chemistry itself, it is even a truly appropriate effort because it can restore students' understanding that all phenomena including scientific discoveries that have been found are destiny that ordained by God about what happened[5]. In addition, the integration of spiritual values into teaching materials can help teachers to increase students' spiritual understanding, because according to research(Darmana et al, 2013) and (Aini, 2014) that the level of spiritual intelligence of chemistry teachers is still in the sufficient category.[4][6]

According to (Darmana et al, 2013) shows that the socialization of the internalization of the value of monotheism through thermochemical material is very effective, it can also motivate groups of students who have low thermochemical cognitive abilities so that they cannot be

distinguished from groups of students who have high cognitive abilities in terms of contributing to the average gain[4]. high level of internalization of the value of monotheism. Research (Harahap & Darmana, 2020) shows that there are differences in learning outcomes and students' spiritual attitudes before and after being taught with integrated teaching materials of spiritual values[7]. According to (Harahap, Sarib, Pane, & Nuraini, 2019) shows that the chemistry practicum guidebook is in accordance with the BSNP and is feasible to use but needs to be developed according to the 2013 curriculum, considering that the practicum guidebook still uses the KTSP curriculum[8]. This research was conducted to determine the feasibility level of developing an integrated spiritual value practicum guide on the reaction rate material based on BSNP.

2 Research Method

The spiritual value integrated chemistry practicum guide in this study will be developed using the ADDIE development model which consists of five stages which include analysis, design, development, implementation and evaluation. This research was only carried out until the development stage. The steps of ADDIE development research are:

Analysis

In the early stages of the ADDIE model to be carried out is an analysis of the syllabus and content standards including the assessment of Core Competencies (KI) and Basic Competencies (KD) as reference materials for developing practical guides in this study. At this stage, an analysis of the SMA/MA chemistry practicum guides circulating in several schools will also be carried out to determine the characteristics, materials and components of the practicum guides. The assessment of the practicum guide includes practicum materials, tools, materials used, as well as the advantages and disadvantages of the practicum guide, as well as assessing the feasibility level using a chemistry lab guide validation instrument in accordance with BSNP.

Design

At the design stage, the researcher will design a chemistry practicum guide for class XI MIPA MA for odd semesters. The design stages that will be carried out include compiling the framework of the practicum guide that will be developed, determining the systematics of developing the practicum guide, determining the spiritual values that will be included in each material and designing an evaluation tool that will be used in the practicum guide.

Development

The practicum guide that will be developed is designed based on the results of the analysis of the Syllabus, KI, KD and the analysis of the outstanding practicum guides. The results obtained at the analysis stage are used to adjust the practicum objectives with the indicators to be achieved based on the K-13 syllabus. Furthermore, it will be continued by developing an integrated practical guide for spiritual values. The practicum guide that will be developed is validated by an expert validator consisting of 2 lecturers at Medan State University and 2 chemistry teachers.

Media Eligibility Assessment

The assessment of the feasibility of an integrated spiritual value practicum guide is obtained from qualitative data of assessment and revision until a product is produced. Qualitative data were analyzed using descriptive analysis. Descriptive analysis is used to describe the percentage of each variable. The rating scale used in the National Education Standards Agency (BSNP) eligibility questionnaire is 1 to 4, where 1 is the lowest score and 4 is the highest score. The calculation in the feasibility assessment of this practicum guide by using the percentage formula and the percentage of the feasibility assessment of the practicum guide is presented in Table 1.

$$\text{Percentage of eligibility scores} = \frac{\text{score obtained}}{\text{max score}} \times 100\% \quad (1)$$

Table1. Media Eligibility Assessment Percentage Score

No	Percentage Rate (%)	Criteria
1	81 – 100	Very Worthy
2	61 – 80	Worthy
3	41 – 60	Decent enough
4	21 – 40	Not feasible
5	0 – 20	Very Unworthy

3 Results and Analysis

Analysis

Before developing a product in the form of a chemistry practicum guide, the researcher conducted an analysis of several chemistry practicum guidebooks circulating in several schools, syllabus analysis and content standards. The purpose of this analysis is to see whether the circulating chemistry lab manuals have integrated spiritual values or not. The integration of spiritual values in the practical guidebook is a manifestation of the Core Competencies (KI-1) contained in the 2013 curriculum.

From the results of the analysis conducted on several chemical practicum guidebooks, there is no practical guide that applies the spiritual values from Qur'an verses contained in Core Competencies (KI-1) in accordance with the 2013 curriculum. This is because the practicum guides compiled and published are distributed to students with various religious backgrounds in different schools[9]. So it is necessary to develop a chemical practicum guide that integrates the verses of the Qur'an.

The integration of the verses of the Qur'an into the developed practicum guide aims to bridge students to grow gratitude for the gift of Allah SWT in life through the chemical materials taught[5]. Because chemistry is not a collection of formulas and reaction equations that must be memorized and then forgotten after graduating from school, but a science that studies the beauty of the regularity of divine laws in the universe. And also students who have high spiritual intelligence will tend to be responsible for their work[10]. So it is necessary to

develop practical guidelines that seek to achieve KI-1 with the mandate of the National Education Goals[11].

Design

After conducting a needs analysis on several chemistry practicum guidebooks from different publishers, the next step is to design an integrated chemistry practicum guide with spiritual values for odd semester MA students. At this stage, indicators are explained based on KI and KD in the 2013 curriculum. The next stage is determining the basic framework in writing a chemistry practicum guide which begins with the design of the cover and components of the chemistry practicum guide content which consists of 3 parts, namely the introduction, core and closing. The introductory section contains the introduction, table of contents, laboratory rules, safety in the laboratory, symbols of hazardous chemicals, laboratory equipment and their uses, preparation of practical solutions and core competencies. The core section contains material related to the verses of the Qur'an and the meaning of the verses of the Qur'an which can be seen in Figure 1, practicum procedures, chemical information about practicum materials and aphorisms which can be seen in Figure 2. The closing section contains the MSDS , glossary, periodic table of elements and bibliography.

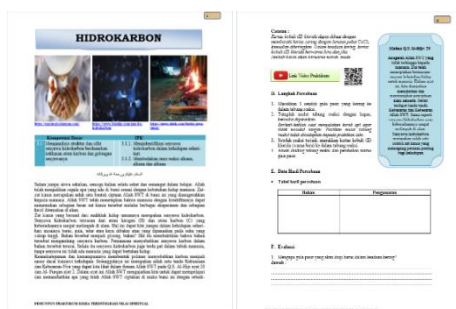


Figure 1. Practical experiments that are integrated with the spiritual values contained in the verses of the Qur'an



Figure 2. Chemistry info and hadith reflections

The chemistry practicum material designed is adapted to the verses of the Qur'an to be integrated in the practicum guide book. The material developed in the form of a practicum guide in accordance with the 2013 curriculum syllabus contains 9 Basic Competencies which are divided into four subjects, namely Hydrocarbons, Thermochemistry, Reaction Rates and Chemical Equilibrium.

The process of writing the chemistry practicum guide framework also underwent several changes in accordance with the suggestions and directions from the supervisor and validator, including the determination of the module outline, placement of images, sentences, color combinations, use of grammar and adjustment of the verses of the Qur'an with chemical material. It aims to produce a practicum guiding framework that is in accordance with the objectives of developing the practicum module.

Development

Assessment of the feasibility of an integrated spiritual value practicum guide

To determine the feasibility level of the spiritual value integrated chemical practicum guide developed, a validity test was carried out. This validation stage aims to get recognition or ratification of the suitability of the product developed with needs so that the product can be said to be feasible and suitable for use in learning [12]. The validity test uses an instrument in the form of a validation sheet based on the National Education Standards Agency (BSNP), namely the feasibility of content, language, presentation and graphics.

The analysis of the feasibility standards for the practical guide that was developed was carried out by 2 chemistry lecturers at the State University of Medan and 2 chemistry teachers at MAN Lubuk Pakam. Based on the results of the assessment by the expert validators, there are several notes that must be considered, then based on the suggestions and input from the validators, revisions are made to perfect the spiritual value integrated chemistry practicum guide developed. The results of the validation by expert validators on the spiritual value integrated chemical practicum guide that was developed can be seen in table 2 and figure 3.

Table 2. Feasibility Assessment of Spiritual Values Integrated Practicum Guide by Expert Validators

Aspects of Assessment	Amount	Score	Percent Rate
Content Eligibility	14	53	94,6
Language Eligibility	6	22	91,6
Serving Eligibility	9	34	94,4
Graphic Eligibility	10	38	95,0

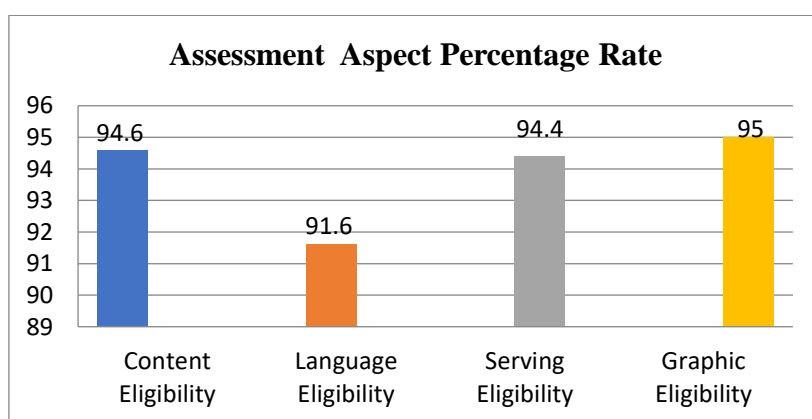


Figure 3. the results of the expert validator's assessment

Based on Table 2 and figure 3, the results of the assessment of the Integrated Chemical Practicum Guide to Spiritual Value developed based on BSNP on the 94.6% content feasibility aspect with excellent criteria, 91.6% aspects of language feasibility with excellent criteria, 94.6 % Aspects of Feasibility Presentation with excellent criteria that are very good and the graphic feasibility aspect is 95% with excellent criteria. So that the feasibility of the integrated chemical practicum guide that has been developed has an average of 93.95% with very good or feasible criteria.

4 Conclusion

The conclusion obtained from this study is that the spiritual value integrated chemistry practicum guide obtained an average eligibility percentage of 93.95% with very feasible criteria by the validator consisting of a chemistry lecturer at the State University of Medan and a chemistry teacher at MAN Lubuk Pakam so that it is suitable for use for learning chemistry.

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