



Development of Jawi Arabic Chemistry Module on Atomic Structure Material at Al-Muslimun Integrated Dayah Lhoksukon

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Abstract: The development of the Jawi Arabic chemistry module on atomic structure material which was carried out at Dayah Terpadu Al-Muslimun Lhoksukon was motivated by the absence of a chemistry module that uses Indonesian or Jawi Arabic, therefore researchers are interested in developing the Jawi Arabic chemistry module as one of the latest innovations that can increase students' interest in learning. The aim of this research is to determine the feasibility of the product and students' responses to the Arabic Jawi chemistry module being developed. The subjects used were class X science students, the sample was 20 Islamic boarding school students and female students. The research method used is Research and Development (R&D) and uses the Borg and Gall model. Data collection techniques were carried out using interview questionnaires as initial needs analysis, product validation questionnaires, and student response questionnaires. Data analysis of validation results and response questionnaires uses a percentage formula. The results of the validation of the Jawi Arabic Chemistry module reached an average percentage of 87.6% in the "very feasible" category and the student response results reached a percentage of 91.92% in the "very good" category. Based on the research results, it can be concluded that the development of the Jawi Arabic chemistry module on atomic structure material is suitable for use as an additional reading reference in Dayah Terpadu Al-Muslimun Lhoksukon.

Keywords: Module, jawi arabic, atomic structure.

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INTRODUCTION

Education according to Islamic teachings plays an important role in efforts to realize a complete human being or insan kamil (Ade, 2017). Therefore, the challenge that must be faced in this modern era is how to implement religious values in students through the learning process both in general schools and religious madrasahs commonly known as Islamic boarding schools or dayah. Through educational institutions like this, students will get two knowledge at once, namely general knowledge and also religious knowledge.

Al-Muslimun integrated dayah is one of the dayahs in Aceh, precisely in Meunje village, Lhoksukon City, North Aceh Regency. This dayah is one of the modern dayahs that

combines schools with madrasahs, this dayah consists of 3 levels, namely Madrasah Ibtidaiyah, Tsanawiyah and also Aliyah. Starting from the MI level, students are equipped with religious knowledge and also general knowledge, at the Tsanawiyah level this dayah requires all students to study and practice Arabic and English in everyday life, both in the learning process and outside it.

Chemistry is a branch of natural science that studies matter such as structure, properties, changes in matter, and the energy that accompanies it (Sudono, 2020). Chemistry is one of the subjects that is least interested in by most high school students because chemistry is considered a difficult subject, this is what sometimes makes students unwilling and uninterested in studying chemistry further. The view of students who consider chemistry lessons difficult makes students' motivation to learn chemistry disappear. This atomic structure material, apart from being theoretical and abstract, also has its own uniqueness such as material that can be linked to the verses of the holy Qur'an, this is in line with the vision of Madrasah Aliyah which is stated in the curriculum, namely realizing students who are knowledgeable, skilled and achieve based on faith and piety (Sabarni, 2019). In order for a learning process to run well and achieve completion, the role of educators as facilitators in these learning activities is needed, educators are also required to be innovative and creative in compiling the learning resources used because learning resources have a significant influence on learning outcomes. To obtain increased learning effectiveness, there needs to be renewal, so there must be a new innovation in learning. One innovation that can increase the effectiveness and interest of students in learning is the module. The module is an independent teaching material so that students are also required to be independent without direct guidance from the teacher. The existence of the module is very important to support the achievement of the expected learning objectives because the module itself can provide information and help students' learning activities to be more focused (Ressy, 2021). The purpose of this study was to determine the feasibility of the Arabic Jawi chemistry module implemented for students and to determine students' responses to the Arabic Jawi chemistry module on the atomic structure material at the Al-Muslimun Integrated Dayah.

Based on the problems that have been raised in the background of this study and the results of the researcher's observations and interviews with chemistry teachers at Al-Muslimun Lhoksukon Integrated Dayah, it can be concluded that the development of a chemistry module using Jawi Arabic on atomic structure material as one of the latest innovations is expected to increase students' interest in learning and motivation to learn on Atomic Structure material. This is because educators only use textbooks as learning resources and have not used learning media such as Jawi Arabic modules. Jawi is Arabic writing but written in Malay. Jawi or Malay Arabic script comes from Arabic script that entered the Malay archipelago along with the entry of Islam. Jawi script is also often known as Arabic-Malay script, especially in the Sumatra region except in Aceh, in Aceh it is more commonly known as Jawi or Jawoe script (Teuku, 2020). The characteristics of the Malay Arabic script include being written and read from right to left like the original Arabic script, the number of Malay Arabic letters is 37 variants of letters consisting of 32 hijaiyah letters and there are several additional letters in the Javanese writing that are not in the hijaiyah letters including the addition of three dots above or below a letter, or the addition of the letter itself for example (چ) c, (ف) p, (غ) ng, (ن) ny, (ك) g.

All Malay Arabic letters are consonants including Alif, the illat waw and ya letters are called illat letters so that they can be read, Malay Arabic letters require harakat syakal punctuation marks such as u, i, a which function as consonants. Another characteristic is that Arabic Malay writing generally does not use harakat marks so that it looks like Arabic Gundul, there are two types of harakat/syakal typical of Arabic-Malay, namely harakat e written with (~) and harakat o written with (0), but these punctuation marks are no longer commonly used (Cikawati, 2020). Instead, it is used to indicate significant sounds only. However, readers will understand and match according to the context.

METHODS

The design of this study uses a research and development method (Research and Development) using a qualitative approach. A qualitative approach is a study that produces descriptive data in the form of written words, pictures and not numbers from the subjects studied (Nadirah, 2022). Based on the description above, the design of this study follows the Borg & Gall research and development guidelines, including:

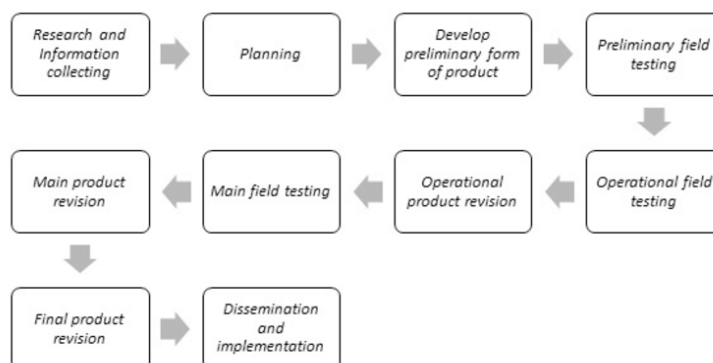


Figure 1. *Research Design*

The research subjects or population are all research subjects who are the focus of attention and sources of research data, while the sample is a portion or representative of the population being studied. The population in this study were all students majoring in science at Al-Muslimun Lhoksukon Integrated Dayah, North Aceh Regency. The determination of the research sample used a purposive sampling technique, expert sampling type with a sample size of 20 students consisting of male and female students in class X.

The data collection instruments in this study consisted of 3 stages, namely the interview stage aimed at chemistry subject teachers and 4 class X students, the second stage was product validation aimed at several expert validators to review in more detail starting from the material, media to the validity of the Jawi Arabic language contained in the module and the last stage was the distribution of student response questionnaires to see how students responded to the module developed by the researcher.

The data analysis technique in this study consisted of several stages, including the validation test sheet analysis technique used in the form of a Likert scale.

Table 1. *Likert Scale Scoring Guidelines*

Category	Score
Excellent	5
Good	4
Medium	3
Bad	2
Very Bad	1

Table 2. *Arabic Jawi Module Eligibility Percentage Score*

Category	Percentage
Excellent	81% - 100%
Good	61% - 80%
Medium	41% - 60%
Bad	20% - 40%
Very Bad	≤ 20%

The total validator score will be calculated using the following percentage formula,

$$P = \frac{\sum X}{\sum XI} \times 100 \%$$

Information:

P = Percentage

$\sum x$ = Score Total

$\sum x i$ = Ideal Score Total

As for the data analysis technique for the student response questionnaire, the assessment guidelines use the same Likert scale score guidelines, as in the table above, while for the percentage level score, the following guidelines are used:

Table 3. Student Response Questionnaire Percentage Score

<i>Percentage (%)</i>	<i>Criteria</i>
81-100	Excellent
61-80	Good
41-60	Medium
21-40	Bad
0-20	Very Bad

The score results obtained will be calculated using the following formula:

$$p = \frac{f}{N} \times 100\%$$

Keterangan:

P = Score Acquisition

F = Total Scores Obtained

N = Maximun Total Score

RESULTS

Based on the results of the development research conducted at the Al-Muslimun Lhoksukon Aceh Utara Integrated Dayah, researchers found data related to the development process of the Arabic Jawi chemistry module on the atomic structure material. This development uses the Borg and Gall model, but researchers only use 7 stages. The following are the results of the Arabic Jawi chemistry module development process that have been carried out:

Identifying Problems

At the stage of identifying problems, researchers conducted an initial needs analysis using interview techniques, which were aimed at all chemistry teachers at the dayah and 4 students, researchers obtained information that in the learning process they had never used a chemistry module either in Indonesian or using Arabic Jawi, chemistry teachers and students also stated that they only used printed books by Drs. Unggul Sudarmo, M. Pd entitled Chemistry for SMA/MA class X as a learning resource so that there is a need for a chemistry module using Arabic Jawi as one of the latest innovations, this is continuous with the dayah curriculum which has taught students to learn Arabic Jawi books. Collecting Data

The steps consist of interviews, identifying problems, collecting reference sources, planning stages and product trials. The questions included in the interview questionnaire were about the curriculum, learning sources and how students responded to the product to be developed. Based on the results of research conducted by several previous researchers related to the development of teaching materials or modules using Arabic Malay (Jawi) received a positive response from students. Therefore, the researcher also wants to develop an Arabic Jawi chemistry module on the atomic structure material at the Al-Muslimun integrated dayah. The researcher looked for reference materials through

electronic modules that were in accordance with the concept of the material being studied and then summarized them so that students could easily read and understand the material presented in the chemistry module using Arabic Jawi later, for the trial stage carried out in this development research, only one stage with a population of all students majoring in science class X.

Designing Products

The design or material contained in this module is in accordance with the curriculum implemented in the Al-Muslimun integrated dayah, namely the 2013 curriculum. The first thing to do is to collect supporting materials such as the Canva application in order to create an attractive module, then the researcher collects appropriate material concepts, easy to understand by students and also concise, as for the materials contained using references from the SMA Chemistry learning module (Kemdikbud).

Product Validation and Revision

The Arabic Jawi chemistry module on the atomic structure material contains several parts, namely the cover, foreword, table of contents, Arabic Jawi reading guide, glossary, module usage instructions, core competencies, basic competencies, competency achievement indicators, learning objectives, concept maps, atomic structure material, summary, practice questions, and bibliography. The text in the module uses the Amiri font with a font size of 12 on all module contents except for the title on the front cover using a font size of 51, the selection of this font size is adjusted to the needs of the reader so that it is not too small and easy to read. Based on suggestions and criticisms from 3 validators, the researcher revised the Arabic Jawi module that was developed, including the following sections:

Cover

The researcher received suggestions from validators 1 and 2 regarding the logo or study program identity on the cover should be enlarged, images of atomic structures should be added and it would be better to combine colors so that the cover looks more lively.



Figure 2. Cover Display

Writing Layout

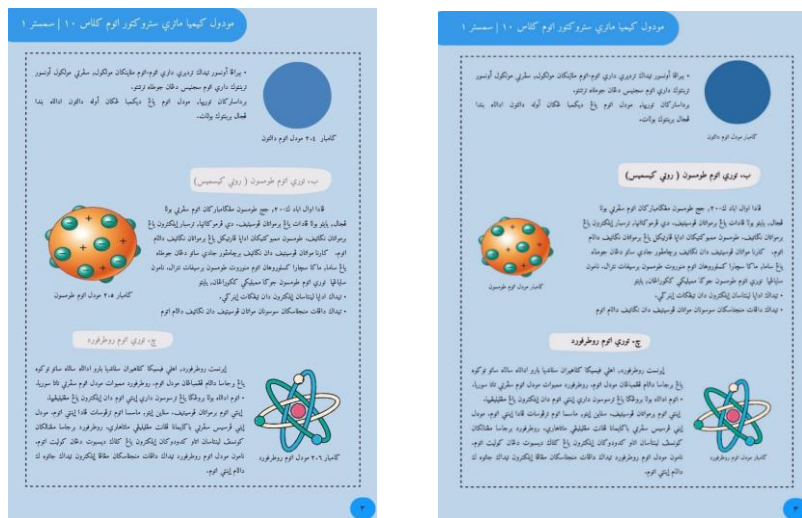
On the contents of the module on page 12, it discusses indicators of competency achievement and learning objectives, so the input from the validator is that the layout is still wrong so it must be corrected.



Figure 3. Writing Layout Display

Improvements to the design

The initial design of the module on several pages used dark gray text with a white background and a transparency level of 70 on each sub-heading, this received input so that the text color of the sub-headings was made clearer (bold) or the background color was replaced with another color. The input from the third validator was that the images attached to the module must be given a clear description.



Before

After

Figure 4. Subtitle Design

Product Testing

The total number of students appointed as samples to fill out the response questionnaire was 20 students, while the percentage results obtained at the product trial stage were

91.92%. These results indicate that students are very interested in the module developed by the researcher. Based on the results of the validation test conducted by 3 validators on the media, language and material aspects, the average percentages were obtained as follows:

Table 4. Overall Validity Percentage

No	Validator	Percentage (%)	Criteria
1	Media aspects	88%	Excellent
2	Language aspects	88,3%	Excellent
3	Material aspects	86,6%	Excellent
Rata-rata skor total		87,6%	Excellent

Based on the data in Table 4, it can be concluded that the Arabic Jawi chemistry module on atomic structure material that was developed obtained the criteria of "very feasible" with a percentage in the media aspect of 88%, the language aspect of 88.3%, the material aspect of 86.6%, thus obtaining an average of the total score average was 87.6%. Based on the validation results, the module developed is considered suitable to proceed to the product trial stage or response test to the Arab Jawi module in the Al-Muslimun Integrated Dayah, after carrying out revisions in accordance with suggestions and input from the three validators.

The sample used in the product testing stage was 20 students consisting of 10 male and 10 female students in class X. The sample selection used the purposive sampling technique of the expert sampling type (expert sample), where the students appointed as samples had met the required sample criteria. by researchers such as being able to read Arabic Jawi script and also being proficient in the field of chemistry studies, the results of the Arabic Jawi module trial received a positive response from all class X students, this can be seen based on the average score of 59.75 with a percentage of 91, 92%, for the percentage level included in the range of 81-100, it is included in the "very good" category.

DISCUSSION

The development of the Arabic Jawi chemistry module on the atomic structure material using the Borg and Gall model received positive results, this can be seen from the average score of the validator percentage and student responses. Based on the average score, the developed module can be used as an alternative for educators to vary the types of learning resources in order to increase the students' interest in learning. The appearance of the module cover can also arouse further curiosity about the contents contained in the module, therefore the researcher designed it as attractive as possible from the cover to the materials using short but easy-to-understand language so that it can encourage students to think critically, the researcher also includes pictures according to the material discussed so that students find it easier to describe and understand the contents of the material, the material contained in the module has also been adjusted to basic competencies, core competencies, and learning objectives. The results of this study are in line with research stating that the development of inquiry-based modules in history learning using the Borg and Gall model can be used as a means of processing material so that the material presented can foster the ability to solve problems systematically, critically, logically and confidently, educators can also vary learning resources in order to overcome the problem of limited time allocation for history learning such as developing this inquiry-based module (Arman, 2019).

CONCLUSION

Based on the results of the research and data analysis that have been carried out, it can be concluded that the Arabic Jawi chemistry module on the atomic structure material can be

said to be feasible to be developed, this is in accordance with the results of the average percentage of the media aspect, language aspect and material aspect which obtained an average percentage of 87.6% and included the criteria "very feasible". The questionnaire test of student responses to the Arabic Jawi chemistry module on the atomic structure material at the Al-Muslimun integrated dayah, especially class X, received a positive response and obtained an average percentage of 91.92%, so it is included in the criteria "very good".

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