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ATOMIC STRUCTURE AND CHEMICAL ELEMENTS (ISLAMIC PERSPECTIVE) BOOK AS A LEARNING RESOURCE

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Abstract

This research is a detailed examination of the development of the chemistry educational sources. The aims of the research are to describe (1) the validity of teaching material (2) the students' responses to the teaching material developed. The type of research is research and development (R&D), with model 4D by Thiagarajan. The stages development of 4D are define, design, develop and desseminate. The subjects of this study are students and lecturers of UIN Antasari. The data collection techniques and instruments used in this study are interview guides, questionnaires and observations. Based on the results of expert validation: validation of material experts with an average of 81% with the criteria "Very Valid" and validation of media experts with an average of 83.4% with the criteria "Very Valid" state that the teaching material developed is very valid and is suitable as teaching material. The percentage score of 91.6% with the "Very Good" criteria is obtained from the responses of 10 chemistry education students of UIN Antasari Banjarmasin to the teaching material developed. This book can be used in learning process that involves both students and lecturers.

Keywords : Atomic Structure , Islamic Perspective, Self Learning Resource

Abstrak

Penelitian ini merupakan penelitian pengembangan sumber belajar kimia. Penelitian ini bertujuan untuk mendeskripsikan (1) validitas bahan ajar (2) respon siswa terhadap bahan ajar yang dikembangkan. Jenis penelitian yang digunakan adalah penelitian dan pengembangan (R&D), dengan model 4D oleh Thiagarajan. Tahapan pengembangan 4D yaitu define, design, develop, dan desseminate. Subjek penelitian ini adalah mahasiswa dan dosen UIN Antasari. Teknik dan instrumen pengumpulan data yang digunakan dalam penelitian ini adalah pedoman wawancara, kuesioner dan observasi. Berdasarkan hasil validasi ahli: validasi ahli materi dengan rata-rata 81% dengan kriteria "Sangat Valid" dan validasi ahli media dengan rata-rata 83,4% dengan kriteria "Sangat Valid" menyatakan bahwa bahan ajar yang dikembangkan sangat valid dan layak digunakan sebagai bahan ajar. Persentase skor 91,6% dengan kriteria "Sangat Baik" diperoleh dari hasil tanggapan 10 orang mahasiswa pendidikan kimia UIN Antasari Banjarmasin terhadap bahan ajar yang dikembangkan. Buku ini dapat digunakan dalam proses pembelajaran yang melibatkan mahasiswa dan dosen.

Kata kunci: Struktur Atom, Perspektif Islam, Sumber Belajar Mandiri

INTRODUCTION

The Chemistry Education Department is one of the Study Programs at the Faculty of Tarbiyah and Teacher Training of UIN (State Islamic University) Antasari Banjarmasin. In 2017, this department accepted the first batch of students. One of the missions of the Chemistry Education Department is to provide chemistry education through Islamic learning, student-centered and based on local wisdom. This is in line with the vision of UIN Antasari itself, namely "Unggul dan Berakhlak" which makes this institution take part in connecting Islam and modern science. In addition, this campus also wants to instill noble Islamic values for its graduates.

Struktur Atom dan Kimia Unsur is a compulsory subject taught at the Chemistry Education Department, UIN Antasari. After interviewing the students of the department, the authors found that students considered this material quite difficult because it was abstract and they were less motivated in learning. In addition, the chemistry books that they often encounter, either purchased or available in the library, rarely connect them with aspects of Islam (Qur'an). Most books only discuss the science of chemistry without any wisdom and values as if chemistry has nothing to do with religion, including the material atomic structure and elemental chemistry. In addition, there is no UIN Antasari lecturer who has made a book on this subject that is integrated with Islam.

The lack of understanding of the context of the sentence is the main problem encountered in understanding books (Aisyah, 2016). Therefore, educators are supposed to create attractive learning both in teaching methods or developing communicative and applicable teaching materials that are close to everyday life. Especially for UIN Antasari which is an Islamic university that teaches religious and general knowledge (science) which also functions to instill noble values for students. It is hoped that teachers can make books/modules connected with aspects of Islam in the hope that students learn science more realistically, not only as an abstract concept and far from religious values.

The integration –interconnection paradigm is directed at unifying the three main areas of religious and scientific knowledge, namely natural sciences, social sciences, and humanities so that they no longer stand alone, but are interrelated with each other (Siswanto, 2013. The confirmative model is an integration –interconnection study model which means 2 different knowledge strengthen each other (Muslih, 2017). With

this model, students are supposed to absorb deeper knowledge. In addition, as students on islamic campus, they must have better understanding in the the context of islam rahmatan lil'alamin.

Books and modules are part of the teaching materials. A set of learning tool, method, limitation, and way of evaluation created to gain objective is called as teaching materials (Chomsin dan Jasmadi,2008). Textbooks can facilitate the learning process to help students achieve competency (Suwarni, 2015). This result is strengthened by the thoughts of Husna et al (2020) claiming that the integrated module is effective and able to improve student learning achievement. According to Saputra and Advinda (2018), module nuanced Quran is suitable in teaching and it assists student and teacher in teaching especially in increasing achievement of student. This is in line with the research result of Rufii (2015) explaining that the module is needed and is a necessity for students to develop their independence and performance in class. Based on the explanation above, it is important to make this research.

METHODS

The type of research is research and development (R&D), with model 4D by Thiagarajan. The stages development of 4D are define, design, develop and desseminate . This model is chosen because it is structured programmatically and simply, which aims to solve problem learning. Instruments in this study are questionnaire, sheet interview, and documentation adapted from Salamiyah (2022).

The subjects of this study are students and lecturers of UIN Antasari. The data collection techniques and instruments used in this study are interview guides, questionnaires and observations.

This study uses data analysis in the form of descriptive verbal data which is analyzed qualitatively.While quantitative analysis is used to analyze the assessment score.

RESULT AND DISCUSSION

A. Development Result

The result of the development is a product in the form of teaching materials " Atomic Structure and Chemical Elements (Islamic Perspective)" which includes a foreword, table of content, content, evaluation, glossary and bibliography. A sample of the final

product from development can be seen in Figure 1 below.

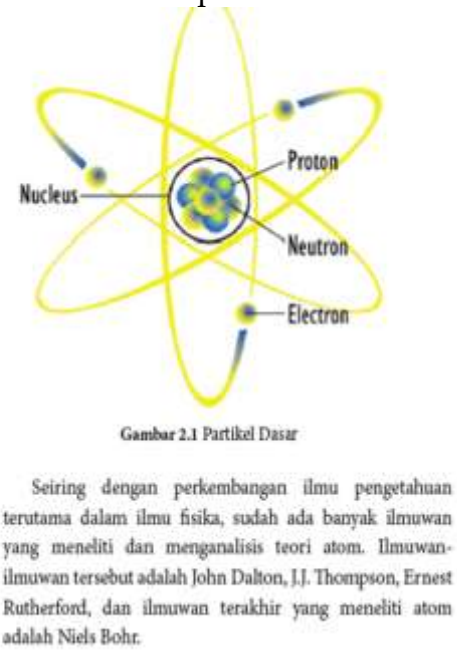

Figure 1. Sample of the book

B. 4D Model Steps

1. Define

It includes 5 stages, namely: (a) Front and Analysis : Initial analysis of Atomic Structure and Chemical Elements (Islamic Perspective) study/material required by students. Documents are in the form of curriculum, syllabus and RPS(semester lesson plan); (b) Learner Analysis : Analysis of students who will receive Atomic Structure and Chemical Elements (Islamic Perspective) material such as educational needs and background. This can be done through interviews; (c) Task Analysis: Analysis of the abilities and tasks that must be mastered by students in order to achieve Minimum Course Learning Outcomes (CPMK). Documentation is in the form of student assignments; (d) Concept Analysis: Analysis of the concept of Atomic Structure and Chemical Elements (Islamic Perspective) which will be taught to students (Preparation of Concept Maps); (e) Specifying Instructional Objectives: Analysis of indicators and learning objectives for the Atomic Structure and Chemical Elements (Islamic Perspective) course in accordance with the specified CPMK.

2. Design

Researcher creates a product design to be developed. Researcher develops a product which contains a foreword, table of content, content, evaluation, glossary and bibliography.

3. Development

This development stage includes validation by material and media experts, revisions, and student responses.

UIN Antasari Chemistry lecturers act as experts in validating the teaching material developed. The purpose of validation is to collect opinions and suggestions for product improvement. The material validation result of 81% is in the "very valid" category. Meanwhile, the media validation result of 83.4% is in the "very valid" category. Based on the validation results, the teaching material created by researcher can be tested after several revisions.

Revisions are made to give a perfect product developed in response to input and recommendations from validators.

Student responses are carried out after the product developed has been revised based on input and recommendations from the validators. This stage aims to find out how students respond to the teaching material created. The result of student responses of 91.6% is in the "very good" category.

4. Disseminate

In the dissemination stage, research is only carried out by providing teaching material to the chemistry lecturers and to the UIN Antasari Chemistry Education Study Program.

C. Validity of Teaching Material

The results of material validation, as determined by material experts, discuss three aspects, namely the quality of content, presentation and language. Media validation includes four aspects, namely display, consistency, use of letters, and physical criteria.

1. Material Expert Validation

Validation of teaching material is made by two experts from chemistry lecturers. The Validation aims to collect opinions, suggestions and inputs regarding the teaching material created. Table 1 below shows the percentage values for each aspect.

Table 1. Validation by Material Experts

No	Aspect	Average value per aspect	Percentage	Category
1	Content of quality	3,1	79,2 %	Valid
2	Presentation	3,4	85 %	Very valid
3	Language	3,0	77,5 %	Valid
Average		3,2	81 %	Very valid

Based on Table 1 above, it can be seen that **the validation result from material experts obtains an average value per aspect of 3.2 and an average percentage of 81% in the "very valid** " category. Content of Quality is 79.2 % in the "valid" category.

Presentation is 85% in the "very valid" category, and Language is 77.5 % in the "valid" category.
Presentation aspect obtains the highest percentage, namely 85 %, indicating that the two media validators tell that the teaching material is systematic. The introduction is consistent and effective. The activities involving students are quite interesting. It encourages students' curiosity , and creates the ability to ask questions.
The product developed meets the validity aspect with very valid criteria.

2. Media Expert Validation

Media validation is carried out by 2 chemistry lecturers. The media experts validation results are shown in Table 2 below:

Table 2. Validation by Media Experts

No	Aspect	Average value per aspect	Percentage	Category
1	Display	3,4	84 %	Very valid
2	Consistency	2,8	70,8 %	Valid
3	Use of Letters	3,6	91,7 %	Very valid
4	Physical Criteria	3,5	87%	Very valid
Average		3,3	83,4%	Very valid

Based on Table 2 above , it is clear that the validation result from media experts obtains an average value per aspect of 3.3 and the percentage per aspect for Display is 8.4 % in the "very valid" category, Consistency is 70.8 % in the " valid" category. Use of Letters is 91.7 % in the "very valid" category, and Physical Criteria are 87 % in the "very valid" category. The aspect of using letters obtain the highest percentage, namely 91.7 %, indicating that the use of variations in letters (*fonts*) is not excessive and the use of spacing between lines and letters is appropriate. Based on the validation result in Table 2, it is known that the initial appearance and product layout are both visually attractive in the opinion of the two media validators. Overall, the media experts validation result obtain a score of 83.4 % falls into the "very valid" category. This means that the teaching material developed by researcher deserves to be tested with several revisions.

Revision product made after getting suggestion And input from material and media experts. Revision is one step in the stagevalidation that must be completed first, before conducting trials product.
After the revisions are carried out, researcher determines the student's respond to the teaching material developed to measure the usefulness and attractiveness of the final product.

D. Student Response to Teaching Materials

Teaching material declared very valid is then tested on student's responses. The student's response test aims to determine the convenience and attractiveness of the product. Researcher tests the students' responses by giving questionnaires.

Product testing is carried out with a small group consisting of 10 students from Tadris Kimia UIN Antasari who took the Atomic Structure and Chemical Elements course. In addition, comments or recommendations for the product being developed are also requested from the student . The result of the student's response assessment can be seen in Table 3 below:

Table 3. Student's Response

No	Aspect	Average value per aspect	Percentage	Category
1	Material	3,8	95 %	Very good
2	Presentation	3,7	93 %	Very good
3	Discovery learning and islamic integration	3,5	87,5 %	Very good
4	Language	3,6	91 %	Very good
Average		3,7	91,6 %	Very good

Based on Table 3 above, it can be seen that the result of student's responses has an average value per aspect of 3.7, and the percentage per aspect of the material is 95% in the "very good" category, 93% for presentations is in the "very good" category, 87.5% is for discovery learning and islamic integration in the "very good" category, and 91% is for language in the "very good" category.

The material aspect obtains the highest percentage, namely 95%, indicating that information in teaching material provides new knowledge for students. Assignments in teaching material help students understand the material, making learning more independent and examples of the application of the material can be found in everyday life.

Overall, the result of student's responses obtains a score of 91.6% in the "very good" category, indicating that the teaching material is suitable to use by students. This result is strengthened by the thoughts of Husna et al (2020) claiming that the integrated module is effective and able to improve student learning achievement. According to Saputra and Advinda (2018), the nuanced Quran module is suitable in teaching and it assists students and teachers in teaching especially in increasing student achievement. This is in line with the research results of Rufii (2015) explaining that the module is needed and is a necessity for students to develop their independence and performance in class.

CLOSURE

The conclusions that can be driven from the research are as follows:

1. Based on the result of expert validation, material expert validation is an average of 81% with the "Very Valid" criteria and media expert validation is an average of 83.4% with the "Very Valid" criteria stating that the teaching material developed is very valid and is suitable to use as teaching material.
2. The percentage score of 91.6% with the "Very Good" criteria is obtained from the responses of 10 chemistry education students of UIN Antasari Banjarmasin to the teaching material developed

The results of this study are used as input for educators. This book can be used in learning processes that involve both students and lecturers. Lecturers should be more creative in teaching, and students should be more active in learning to get learning experiences.

it is recommended that researchers test the effectiveness of teaching material to determine student learning outcomes.

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