



THE ANALYSIS OF CHEMISTRY BOOK'S EFFECTIVENESS IN LEARNING PROCESS

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ABSTRACT

A book is useful to train students to learn independently which are systematically arranged to achieve learning objectives. Learning using modules will make learning more effective, efficient and relevant. The purpose of this research is to specify the effectiveness of the book : Atomic Structure and Chemical Element. This is a field research by using pretest - posttest control group design. The sample is 11 Chemistry Education students for the Chemistry Class, Odd Semester 2023/2024 chosed to assure a deputy cohort. Interview, documentation, and test questions are carried out to get the data by using the N-Gain test. The grade of students is 0.5 in the moderate category. It explains that the book can upgrade students' knowledge and understanding. Learning with the developed book can make students more viable in the class and has been potent in upgrading student learning achievements. Therefore, it is recommended that lecturers in the field of Chemistry Studies can use this book and can develop it for other discussion topics.

Keywords: *Chemical Element, Islamic Perspective, Effectiveness,*

INTRODUCTION

Chemistry is a part of natural science that holds equal importance to other fields such as physics, biology, geology, and astronomy. Chemistry encompasses theoretical concepts and mathematical elements. Before beginning chemistry lessons, students often have a negative preconception that chemistry is difficult, even though they don't fully understand it. They perceive chemistry as a complicated subject. This preconception affects various aspects of students' lives: cognitive, emotional, practical, and scientific. One of the most noticeable impacts is a decline in student interest in chemistry. This can be a challenge for teachers and schools in increasing student interest and motivation (Harefa et al., 2020). In fact, student interest in learning chemistry is low. This is affected by several factors, including the unappealing presentation of chemical concepts in textbooks, ineffective teaching methods employed by teachers, negative information about chemistry circulating in the community, and a lack of

goals or motivation in students to learn chemistry. These factors contribute to low student interest and enthusiasm in learning chemistry (Subagia, 2014).

One of the compulsory courses at UIN (State Islamic University) Antasari is Atomic Structure and Chemical Elements. In interviews in 2024 conducted by the author, many students considered that chemistry was difficult and it was difficult to them to think deeply. Furthermore, the books that they used, especially those related to Islam and science, were difficult to find in libraries or bookstores.

One of the most significant parts in the class activity is teaching material. Teaching materials are designed to transfer learning messages from teachers to students, thereby stimulating students' thoughts, feelings, interests, and willingness to learn (Serevina et al., 2018). Modules can facilitate students to learn independently and get to know their creator through science, Zaharah, et al. (2017) and Saputra (2018) state that modules are complete units or learning resources to train

students to learn independently which are systematically arranged to achieve learning objectives. Learning using modules will make learning more effective, efficient and relevant. In addition, the role of teachers in teaching and learning activities is as a facilitator, no longer as a dominant party so that learning will be more student-based (Permadi, 2018). Next, modules are important parts during the class activity (Ruffi, 2015). The lack of integrated modules will affect the effectiveness of learning. Research by Mubarok (2015), Khairiyah and Faziah (2019), Agusti, et al. (2019) and Saputra (2018) reveal that learning with integrated modules with Islamic values can upgrade student learning achievement.

Research (Purwati et al., 2018) states that learning through the integration of science and Islamic sense can upgrade student achievement. This is also found in research by Ali et al. (2015), Pattaro (2016), and Munir (2016), which find that integrating Islam and science can improve student learning outcomes and creativity along with improving character. The purpose of this research is to specify the effectiveness of the teaching materials in terms of student achievement.

RESEARCH METHODS

This is a field research by using pretest - posttest control group design. The sample is 11 Chemistry Education students for the Chemistry Class, Odd Semester 2023/2024 chosen to assure a deputy cohort. Interview, documentation, and test questions are carried out to get the data by using the N-Gain test. The grade of students is 0.5 in the moderate category.

The data analysis of this research is a test of the effectiveness of the book. The results of the *pre-test* and *post-test scores* are counted on average to specify the grade ratio

before and after using the teaching material in small cohort during the class activity. Then the data are counted by using *N-Gain* Heke's formula in Meltzer:

$$N - Gain = \frac{S_{post} - S_{pre}}{S_{max} - S_{pre}}$$

Information:

S_{post} : Post-test Score

S_{pre} : Pre-test Score

S_{max} : Maximum of ideal score

N-Gain score is displayed in table 1 below:

Table 1. N-Gain Categories

Score	Classification
$G > 0.7$	High
$0.3 < G \leq 0.7$	Moderate
$G \leq 0.3$	Low

(Source: Salamiyah, 2023)

RESULTS AND DISCUSSION

Before learning using the developed book, students first complete a pre-test. During the process, students are confused due to not yet understanding the material. After completing the tasks, the researcher divides the students into several groups. The group division proceeds smoothly. Students seat in their respective groups. Afterward, the researcher provides guidance on the learning process using the book which integrates Islamic values.

The use of textbooks is hoped to aid students understand the material more easily. As explained by Rachmawati et al. (2023), Learning with an Islamic teaching system has been proven to improve students' character. Teaching action using this book not only help students comprehend the lesson but also keep a strong sense of curiosity to meet the



concepts on their own. This aligns with Abdullah (2017)'s argument that teaching that implicates both physical and mental activity will lead to maximum result. When students have discovered the draft of the course being researched, it is hoped that their activities and learning outcomes will improve even further.

Student learning outcomes in this study are measured by using pre-test and post-test evaluations. The pre-test and post-test results are analyzed by using the N-Gain score shown in table 2 below.

Table 2. Student Score Results

Number	Pre-test	Post-test	N-Gain	Category
1	60	90	0.8	High
2	70	75	0.2	Low
3	70	75	0.2	Low
4	70	80	0.3	Low
5	70	95	0.8	High
6	80	90	0.5	Moderate
7	70	75	0.2	Low
8	70	75	0.2	Low
9	80	90	0.8	High
10	80	95	0.9	High
11	80	90	0.5	Moderate
Average	69	85	0.5	Moderate

Source: Data Processed, 2024

Based on table 2, data analysis is performed. It is found that the average score of the test grade before using the book is 69 with a maximum score of 80 and a minimum score of 60, while after using the book the average score increases. The grade of post-test is 85 with a maximum score of 95 and a minimum score of 75. The value of data is then counted as an average value to specify the ratio before and after using the teaching material by using N-Gain. The average N-Gain score is 0.5 in the moderate category. The results of the N-Gain students can resume that the book created can improve students' achievement. The results show that the learning outcomes of the cognitive aspect have escalated. This is in line with study by Nasution (2024) that the use of book that integrates Islam and science can improve student learning outcomes. Febrinita (2022)

CONCLUSION

The effectiveness of the book reviewed from the learning outcomes of

also says that the use of teaching material in learning is effective in escalating learning outcomes in the moderate category.

Affective assessment is conducted to determine the criteria for students' attitudes in conducting group discussions during the learning process. In the learning process, the affective aspects assessed are curiosity, thoroughness, motivation, and cooperation. Students' curiosity is manifested in the stimulation and problem statement steps in the discovery learning method contained in the textbook. This occurs because learning using the invention teaching design can foster active methods by discovering and investigating for themselves. Therefore, the results obtained will be loyal and long-lasting in memory, not easily forgotten by students (Kusumayuni, et al., 2023). Furthermore, the aspects of thoroughness, motivation, and cooperation are manifested when working on the contents of the book.

The results of the psychomotor aspect can be seen when students engage in group discussions through observation. Although the N-Gain score obtained by students is in the "moderate" category due to several obstacles that occur in the field, namely students are not focused because the learning process coincides with the schedule for presenting scientific papers held by the school, and students who live in dormitories (boarding schools) make them bored with learning. In line with the results of research (Atikah, 2020) states that there is boredom in the learning of students in boarding schools. Students feel indifferent when learning, not focused when learning, and students are busy with their own world.

students shows an average value of 0.5 with the criteria of "Moderate". There is an increase in student understanding. Then the affective and psychomotor aspects show

positive results by students during the learning process with the book. Learning with the developed book can make students more active in the teaching and class activity and is verified to be potent in upgrading student's achievement. It is recommended to lecturers in the field of Chemistry Studies be able to use this book and can develop it for other discussion topics.

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