



The Level Of Difficulty Of The Midterm Assessment Of The Chemical Bonding Course In Chemistry Education, Uin Antasari

Siska Oktapianti

UIN Mahmud Yunus Batusangkar, West Sumatra

Email: siskaoktapianti2@gmail.com

Received 15-07-2025 | Revised form 10-08-2025 | Accepted 11-09-2025

Abstract

To determine the success of an educational program, an evaluation is required. The process of compiling questions in the chemistry education study program at UIN Antasari has not paid much attention to the level of difficulty of the questions. The purpose of this study is to determine the level of difficulty of the Midterm Assessment of the Chemical Bonding course in Chemistry Education, UIN (State Islamic University) Antasari in the Odd Semester of the 2021/2022 Academic Year. This study uses a quantitative descriptive method. The analysis in this study is carried out quantitatively by calculating data based on a formula, then the results of the data obtained are described descriptively. The data collection techniques and tools used in this study are interviews and documentations in the form of grids, questions, answer keys, and answer sheets. This test has 9 questions given to 12 students. The results of this study are that there are 6 questions (66.7%) in the moderate category and 3 questions (33.3%) in the easy category and no questions in the difficult category (0%) so that it can be said that these questions have good quality. Questions with good quality can be stored in the question bank to be reused in future evaluation activities, while questions that are not good quality must be discarded or changed.

Keywords: Difficulty level, exam, chemical bonding

Abstrak

Untuk menentukan keberhasilan suatu program pendidikan, diperlukan evaluasi. Proses penyusunan soal dalam program studi pendidikan kimia di UIN Antasari belum memberikan perhatian yang cukup terhadap tingkat kesulitan soal. Tujuan penelitian ini adalah untuk menentukan tingkat kesulitan Ujian Tengah Semester mata kuliah Ikatan Kimia dalam Program Studi Pendidikan Kimia, UIN (Universitas Islam Negeri) Antasari pada Semester Ganjil Tahun Akademik 2021/2022. Penelitian ini menggunakan metode deskriptif kuantitatif. Analisis dalam penelitian ini dilakukan secara kuantitatif dengan menghitung data berdasarkan rumus, kemudian hasil data yang diperoleh dijelaskan secara deskriptif. Teknik dan alat pengumpulan data yang digunakan dalam penelitian ini adalah wawancara dan dokumentasi berupa grid, pertanyaan, kunci jawaban, dan lembar jawaban. Ujian ini terdiri dari 9 pertanyaan yang diberikan kepada 12 mahasiswa. Hasil penelitian ini menunjukkan bahwa terdapat 6 pertanyaan (66,7%) dalam kategori sedang, 3 pertanyaan (33,3%) dalam kategori mudah, dan tidak ada pertanyaan dalam kategori sulit (0%), sehingga dapat dikatakan bahwa pertanyaan-pertanyaan ini memiliki kualitas yang baik. Pertanyaan dengan kualitas baik dapat disimpan

dalam bank soal untuk digunakan kembali dalam kegiatan evaluasi di masa depan, sementara pertanyaan yang tidak berkualitas baik harus dibuang atau diubah.

Kata kunci: Tingkat kesulitan, ujian, ikatan kimia

This is an open access article under the [CC BY-NC-SA](https://creativecommons.org/licenses/by-nc-sa/4.0/) license.



INTRODUCTION

Evaluation plays an important role in the learning process. If the results of the evaluation are in accordance with the learning objectives, the learning program can be said to be successful. Therefore, evaluation is considered important in creating an ideal world of education. Evaluation is a process of planning, obtaining and providing information that is very important for making alternative decisions. (Alpusari, 2014). Learning evaluation is useful for collecting information that is the basis for measuring the level of progress, development, and learning achievement of students, as well as the effectiveness of educators in teaching. The purpose of learning evaluation is to assess the effectiveness of learning strategies, improve the effectiveness of curriculum programs, know the strengths and weaknesses of students, and provide information or data playing an important role in making decisions. (Asrul, 2015)

Important activities in learning evaluation are measurement and assessment. Evaluation tools are useful for measuring or evaluating something with results such as the conditions being evaluated. This evaluation tool is also called an evaluation instrument. In using evaluation instruments, there is an evaluation tool called a test. One of the tools used as a means of assessing learning outcomes is a test. According to Anas (2012), a test is a way of measuring and assessing in the field of education in the form of giving assignments or a series of assignments that must be done by students, so that the student's achievement value can be known.

To get an overview of the quality of the test, both the overall quality of the test and the quality of each item, an analysis is needed. The analysis is carried out after the test is compiled and tried out on all subjects and the results become feedback for improving the quality of the test in question. Therefore, test analysis activities are a must in the process of constructing a test.

According to Mardapi (2017:94) a test is a form of instrument used to make measurements consisting of true or false answers, or all true, or partly true. In multiple-choice tests, good questions must have an adequate level of difficulty, good discriminating power, and function as distractors (Suwanto, 2016:3). Educators must have the ability to create good test questions as a tool to measure student learning outcomes so that learning objectives can be achieved. Suharsimi Arikunto (2010:207) said that good questions are questions that are not too easy and not too difficult. Questions that are too easy cannot stimulate students to try hard to solve them. On

the other hand, questions that are too difficult will cause students to become discouraged and have no enthusiasm to try again because they are beyond their reach.

According to Purwanto (2011) there are 3 things that educators can get from question analysis, namely: (1) to what extent is the level of difficulty of the question understood, (2) whether the question has differentiating power so that it can differentiate between smart and less smart students, (3) whether the alternative answers are interesting answers. (Ngalim, 2002)

Chemical bonding is a compulsory subject taught at the Chemistry Education Department, UIN Antasari. Based on the results of interviews with students of Chemistry education at UIN Antasari, they think that Chemical Bonding is a difficult subject because the concepts are interrelated. The main difficulty is that students can only repeat the definitions of the terms in the chemical bonding material, but do not understand the true meaning, or it can be said that students are not yet able to apply the concept of chemical bonds and tend to still rely on memorization (Hairida & Lestari, 2015).

According to the answers from the resource person during the interview session of the evaluation activities carried out at the Chemistry Education Department, UIN Antasari, not many lecturers have paid attention to the assessment of the questions used as measuring tools. The questions created also pay less attention to the level of difficulty so that it is not yet known whether the questions are classified as quality measuring tools or not. From the background of the problems stated above, the researcher is interested in analyzing the level of difficulty of the questions used as evaluation measuring tools.

RESEARCH METHODS

This study used a quantitative descriptive method. The analysis in this study is carried out quantitatively by calculating data based on the formula, then the results of the data are described descriptively. The data collection techniques and tools used in this study are interviews and documentations in the form of grids, answer key, and answer sheet.

From the results of the level of difficulty, researcher will analyze the data from each question item into the level of difficulty criteria index with the following formula:

$$P=R/T$$

P= difficulty level

R=number of students who answered correctly

T=total students

The difficulty level criteria for the questions can be seen in table 1 below:

Table 1. Criteria of Difficulty Level

Mark	Criteria
0.00-0.30	Difficult
0.31-0.70	Moderate
0.71-1.00	Easy

Source: Sundayana, 2016

RESULT AND DISCUSSION

Difficulty level analysis is used to obtain a set of questions that have adequate quality by reviewing test questions in terms of their difficulty so that it can be known which questions are easy, medium, and difficult (Abdul Qodir, 2017:124). Therefore, educators must carry out analysis activities to improve the quality of the test items. (Ratnawulan, 2018:206).

Analysis of the level of difficulty is a number that shows the proportion of students who answer the questions well and correctly. The level of difficulty also examines the evaluation questions to find out whether the questions are included in the easy, medium or difficult category. Questions that are included in the easy and difficult categories have poor quality while questions that are included in the medium (proportional) category have good quality as described in the table 2.

Table 2. Quality of question items

Criteria	Quality of test items
Difficult	Poor
Moderate	Good
Easy	Poor

Source : Dia,eva, 2022

The results of the calculation of the level of difficulty of the Mid-Semester Exam questions for the Chemical Bonding course are as follows:

Table 3. Question Difficulty Level

Question	Difficulty level	Criteria
----------	------------------	----------

1	0.83	Easy
2	0.50	Moderate
3	0.67	Moderate
4	0.83	Easy
5	0.83	Easy
6	0.50	Moderate
7	0.67	Moderate
8	0.33	Moderate
9	0.67	Moderate

Source: Data processed, 2025

The difficulty level criteria of 0.00-0.30 include difficult category questions. The difficulty level of 0.31-0.70 include moderate category questions and the difficulty level of 0.71-1.00 include easy category questions. Based on the results of the analysis using the specified formula, it is known that there are no questions included in the difficult category.

Questions number 1, 4, and 5 show numbers 0.71-1.00 which are included in the easy category. Questions number 2, 3, 6, 7, 8 and 9 show numbers 0.31-0.70 which are included in the moderate category. This test has 9 questions given to 12 students. The results of this study are that there are 6 questions (66.7%) in the moderate category and 3 questions (33.3%) in the easy category and no questions in the difficult category (0%) so that it can be said that these questions have a good quality. Questions with good quality can be stored in the question bank to be reused in future evaluation activities, while questions that are not of good quality must be discarded or changed.

The level of difficulty of questions that are said to be good is a question that is not too difficult and also not too easy, meaning that the question items must have a level of difficulty with a moderate, balanced or proportional category. The level of difficulty of the question items is divided into three categories, namely: easy, moderate and difficult. Questions that are too easy or too difficult are not good quality and can affect the evaluation process and results. They must be proportional or have a moderate level of difficulty.

Zainal Arifin (2011:64) says that the quality of test must be valid, reliable, relevant, presentative, practical, discriminatory, specific and proportional. Analysis of the level of difficulty of the questions aims to identify whether the level of difficulty of the questions is easy, moderate, and difficult. Questions with a balanced or moderate level of difficulty can be said to have good quality. The level of difficulty of a question determines the student's process in solving the question.

Rina Febriana (2019:128) states that a good assessment instrument consists of questions that are not too easy and not too difficult. If these questions are too easy,

they will not be able to stimulate students to increase their efforts in solving them. Conversely, if these questions are too difficult, students will not have the enthusiasm to think and answer because they are beyond their understanding.

CONCLUSION

The results of the calculation of the level of difficulty of the Mid-Semester exam questions for the Chemical Bonding course for the Odd Semester of the 2021/2022 Academic Year contain 9 questions tested to 12 students. After testing, it is found that there are 6 questions (66.7%) in the moderate category and 3 questions (33.3%) in the easy category and no questions in the difficult category (0%). It can be said that these questions have good quality. Questions with good quality can be stored in the question bank to be reused in future evaluation activities, while questions that are not good quality must be discarded or changed.

REFERENCES

- Alpusari, M. (2014). Analysis of Basic Science Concept Question Items 1 Through the Use of Anates Computer Program Version 4.0 For Windows. *Primary Journal of Elementary School Teacher Education Study Program, Faculty of Teacher Training and Education, University of Riau* .3(2)
- Anas, S. 2012. *Introduction to Educational Evaluation*. Jakarta: Raja Grafindo.
- Arifin, Zainal. 2012. *Learning Evaluation*. Jakarta: Directorate General of Islamic Education
- Arikunto, & Suharsimi. 2009. *Basics of Educational Evaluation*. Jakarta: Bumi Aksara.
- Dia,eva.(2022). Transformation of Education Based on Research Results and Community Service in the Era of Independent Learning. *Fourth Conference on Research and Community Services STKIP PGRI Jombang 24 SEPTEMBER 2022*
- Febriana, Rina. 2019. *Learning Evaluation*. Jakarta: Bumi Aksara
- Hairida, E., & Lestari, I. (2015). Students' conceptual understanding of chemical bonding material through self-assessment Muhammadiyah 1 in Pontianak. *sma Jurnal Pendidikan Dan Pembelajaran Khatulistiwa (JPPK)*, 4(8). <https://doi.org/10.26418/JPPK.V4I8.11061>
- Mardapi, D. 2017. *Measurement, Assessment, and Evaluation of Education*. Yogyakarta: Parama Publishing
- Ngalim, P. 2002. *Principles and Techniques of Teaching Evaluation*. Bandung: Remadja Karya.

- Qodir, Abdul. 2017. *Evaluation and Assessment of Learning*. Yogyakarta: K-Media.
- Ratnawulan, Elis, et al. 2014 .*Learning Evaluation*. Bandung: Pustaka Setia.
- Slameto. 2006. *Educational Evaluation*. Jakarta: Bina Aksara.
- Suharsimi, Arikunto.2010 . *Basics of educational evaluation/Suharsimi Arikunto, Revised Ed., 11th ed*. Jakarta: Bumi Aksara
- Sundayana. 2016. *Educational research statistics*. Bandung: Alfabeta
- Suwarto. (2016). Characteristics of Biology Tests for Grade 7 Odd Semester. *Journal of Humanities Research* .17(1).
- Umar, Ahmat s, et al. (2023.) Identification of Students' Conceptual Understanding of Chemical Bonding Material Using Three Tier Multiple Choice Diagnostic Test. *Jambura Journal of Educational Chemistry*.5(1)