Asian Journal of Science Education

Journal homepage: http://jurnal.unsyiah.ac.id/AJSE/

Analysis of Item Difficulty Index for Midterm Examinations in Junior High Schools 5 Bengkulu City

Rapita Pratiwi[1*], Septia Reflianti[1], Sura Antini[1], Ahmad Walid[1]

[1]Science Education Department, Tarbiyah and Tadris Faculty, State Islamic Institute of Bengkulu

*Corresponding email: rapitapratiwi31@gmail.com

ABSTRACT

This study aims to analyze the difficulty level of the IPA UTS items for Class VII and VIII at SMP Negeri 5 Bengkulu City. This study used a qualitative descriptive research design. The instrument used in this study was the text of the Middle Semester Test (UTS) for the Middle School Science Subject for the in Junior High School. The data collected were analyzed using the Difficulty Index formulation. The results showed that the analysis of the difficulty level of the IPA UTS items for Class VII and VII at SMP Negeri 5 Bengkulu City for the academic year 2018/2019 had a difficult question category in grade VII of only 10%, easy question category 15%, and question category which is being 75%. Likewise, Class VIII has only 5% difficult question categories, 10% easy question categories, and 85% medium question categories. This indicates that the quality of the UTS questions is very good.

Keywords : item analysis, difficulty index, mid-term exam.

INTRODUCTION

As a system, education has a number of components, one of which is evaluation. In addition to evaluation, other components are objectives, students, educators, teaching materials, methods, media, and sources (Nadya, et al, 2018). Education has become one of the basic needs of every human being. The implementation of education is in accordance with the philosophy of Pancasila and the 1945 Constitution of the Republic of Indonesia, which functions to develop abilities, shape the character and civilization of the nation with dignity and develop the potential of students to become human beings who believe and have faith in God Almighty, have noble character, are healthy, knowledgeable, competent, creative, independent and a democratic and responsible citizen (Sudijono, 2012).

Assessment activities in the world of education are often equated with the term evaluation activities (Septiana, 2016). In terms of language, assessment is defined as the process of determining the value of an object. To be able to determine the value or price of an object, a measure or criteria is needed (Nana Sudjana, 2010). Assessment is an activity carried out to measure and assess the level of achievement of the curriculum. The purpose of

conducting an assessment is not much different from conducting an evaluation. Carry out an assessment, as a form of evaluation of the application of policies in the field of education and learning systems in a country, it is considered very important (Nadya, et al, 2018).

Evaluation is part of the process and as a whole cannot be separated from learning activities. Evaluation activities have been regulated in the Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System Chapter XVI, Article 58 paragraph 1, states that "Evaluation of student learning outcomes is carried out by educators to help the process of progress and improvement of student learning outcomes on an ongoing basis" (Septiana, 2016). Therefore, the evaluation of learning outcomes aims to assess competency attainment and improve the learning process as well as guidelines for preparing student learning progress reports. And in conducting a good evaluation system, it is hoped that it can measure students' abilities and measure the actual quality of education (Nadya, et al, 2018).

Item analysis is the assessment of test questions in order to obtain a set of questions of adequate quality. Question analysis is a systematic procedure, which will provide very specific information on the test items we compile (Amalia, and Widayati 2012). Meanwhile, item analysis is a systematic procedure that will provide specific information about the items compiled (Kunandar, 2015).

Problem of Research

The reality in the field shows that so far the item analysis activities are rarely carried out which is why the material, question construction, language, validity, reliability, and item analysis which consists of difficulty level, distinguishing power, and question distractor are often said to be low. More precisely, the quality is not known with certainty (Rahmawati, 2012). Analyzing question items is an activity that teachers must do to improve the quality of the questions made (Sumiati, 2018). This activity is the process of collecting, summarizing, and using information from students' answers to make decisions about each assessment. Question analysis aims to identify good, bad, and bad questions (Muluki, et al, 2020).

With question analysis, information about the ugliness of a question can be obtained and instructions for making improvements. Quality questions are questions that can provide information precisely in accordance with the objectives, including determining which students have or have not mastered the material taught by the teacher (Sartika, 2013). Based on the author's observations at SMP Negeri 5 Bengkulu City, the evaluation stage of writing test learning is often carried out, but the activity of analyzing these test questions is rarely done so the quality of the questions is not known with certainty. The results of an interview with one of the teachers of the Natural Sciences subject also explained that question analysis activities were also rarely carried out. Item analysis aims to help improve the test through revision or discarding ineffective questions and to find out diagnostic information on students whether or not students have understood the material that has been taught (Amalia and Widayati, 2012).

Research Focus

The purpose of this study is to analyze the difficulty level of the Science questions of mid-semester at SMP Negeri 5 Bengkulu City for the 2018/2019 academic year.

METHODOLOGY OF RESEARCH

This type of research uses descriptive qualitative research methods. Descriptive research isresearch that describes a symptom, fact, event or incident that is or has occurred (Lufri and Ardi, 2014). The instrument used in this study was the text for Middle Semester Deuteronomy (UTS) for Middle School Science Subjects for the 2018/2019 academic year. This research is intended to find information and data that can be used to describe the quality of the items.

Based on the of research that has been conducted through interviews with Class VII Science Subject Teachers with Ms. Lia Anggraini, she stated that the total number of Grade VII students was 352 students. And the class VIII science subject teacher with Mrs. Wiwik Ulmi, he stated that the total number of class VIII students was 320. The data in this study were collected using documentation and interview techniques. Documentation is a record of events that have passed. Documents can be in the form of writing, pictures, or from someone (Sugiyono, 2013). Documentation is used to collect data in the form of items in the Middle Semester Test of Natural Sciences at SMP Negeri 5 Bengkulu City for the 2018/2019 academic year.

The level of difficulty is a measurement of the degree of difficulty of a question and the chance of answering a question correctly at a certain ability level which is usually expressed in an index form (Anita, et al, 2018). The difficulty index was analyzed for each item. The number of questions in this study were 40 items in multiple choice form with answer options (a, b, c, d) for each grade level.

The data that has been collected will be analyzed using the difficulty index formulation with the formula : $P = \frac{B}{JS}$ where P = Difficulty Indeks, B = The number of Student who answered the questions correctly, and JS = Total number of student (Arikunto, 2009).

The categories used in the assessment of the difficulty index value can be seen in Table 1 (Daryanto, 2010).

Table 1. Difficulty Index Category

| Value	Category
1,00 – 0,30	Hard
0,30 – 0,70	Moderate
0,70 – 1,00	Easy

(Daryanto, 2010)

RESULTS AND DISCUSSION

Based on the result of research, so it can be seen that each item of the science questions of mid-semester at Junior High School 5 Bengkulu City has a different level of difficulty as seen in Table 2.

Table 2. Tabulation of the Difficulty Index for Midterm Examinations.

Category	Item For Class VII	Total	Percentage	Item For Class VIII	Total	Percentage
Easy	4, 12, 13, 15, 25 and 33.	6	15 %	6, 22, 27, and 28.	4	10 %
Moderate	1, 5, 7, 8, 9, 10, 11, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 35, 36, 37, 38, 39, and 40.	30	75 %	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 29, 30, 31, 32, 33, 34, 36, 38, 39, and 40.	34	85 %
Hard	2, 3, 6 and 34.	4	10 %	35, and 37.	2	5 %

Based on the difficulty index tabulation table above, the percentage can be seen as follows.
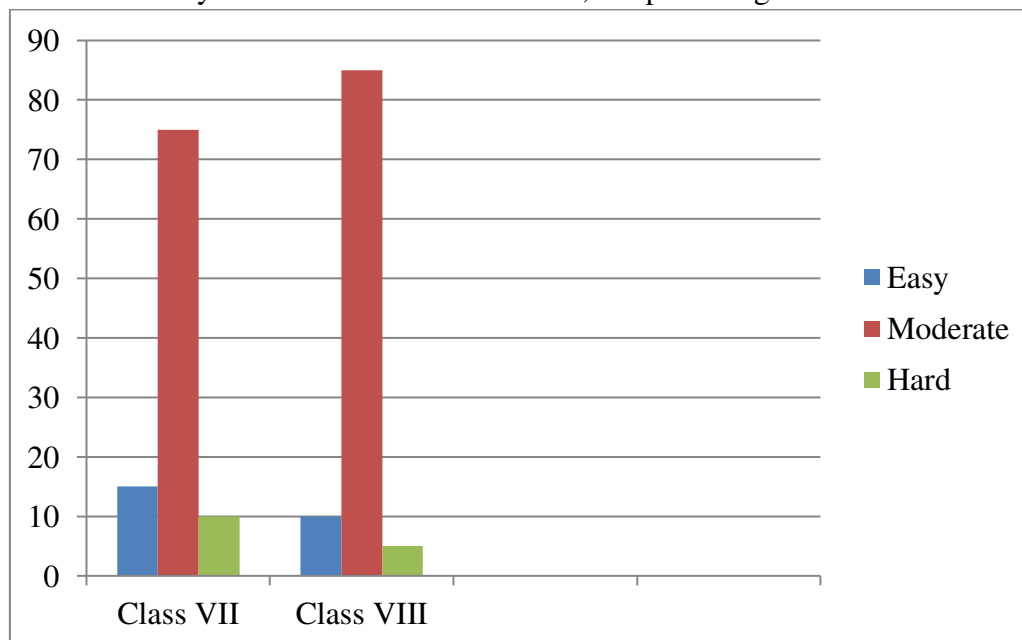

Figure 1. Percentage of Difficulty Index for Midterm Examinations.

Based on Figure 1, it can be seen that the science questions of mid-semester at Junior High School 5 Bengkulu City, totaling 40 items, have good question criteria because the difficult question category in class VII is only 10%, the easy question category is 15% , and the question category is being 75%. Likewise Class VIII has good question criteria because the

difficult question category is only 5%, the easy question category is 10%, and the medium question category is 85%.

Table 4. Results of Value Analysis for Each Class Level

No	Date	Class VII	Class VIII
1.	The Number Of studenst	32	32
2.	The Highest Score	90	95
3.	Lowest value	25	20
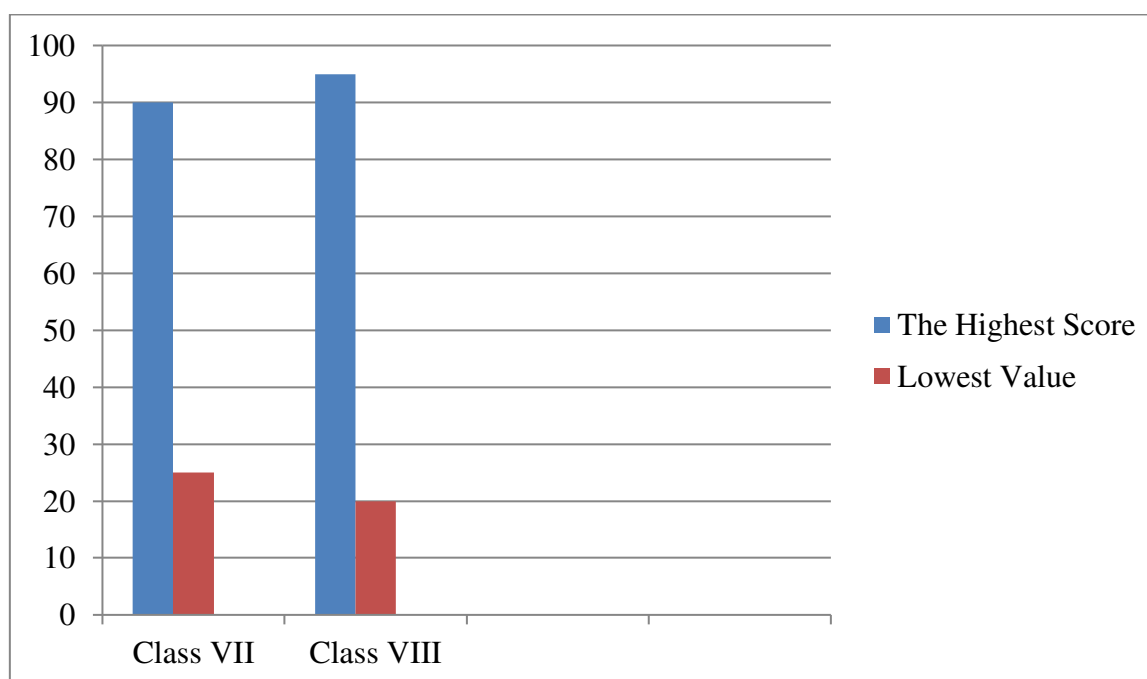
Figure 2. Science Midterm Exam Scores for Class VII and VII in Junior High School 5 Bengkulu City.

This is in accordance with the level of difficulty of the questions, which is the proportion of the number of students who answered correctly a question to all students who worked on the questions so that the categories of questions including easy, medium and difficult were obtained (Yusrizal, et al, 2015). Problems with a good level of difficulty are questions that are not too easy or not too difficult, because questions that are too easy can reduce students' interest (stimulation) in learning, whereas if the questions are too difficult it can make students not excited.

Through the study and analysis of the level of difficulty of the midterm test questions, the feasibility of these questions can be revealed. The difficulty level of the items showed that the questions that had a difficult category in class VII were 10% and those in class VIII were 5%. The results of this study are supported by the theory that the quality or failure of the learning putcome test items can be seen from the difficulty level of the test items, so one of the analyzes cpnducted to determine whether the items can be said to be good as an evaluation tool is the difficulty level (Anas, Sudijono. 2011). This research is also in line with previous

research conducted by Ana Nayla Amlian and Ani Widayati that good items are items that have a moderate level of difficulty (Amalia, A.N & Ani, W. 2012).

One of the factors affecting the quality of the questions is the teacher who compiles the questions (Ariyana, Lilis T. 2011). Requirements for special abilities possessed by a teacher in preparing questions according to standards are mastering the material to be tested, being able to share ideas, understanding the characteristics of test takers and mastering questions writing techniques (Purnomo, A. 2007). In addition to measuring the value of the student sample and the weight of the questions, the quality of the questions can also be seen from the following factors, which can be caused by errors in the answer options, errors in the answer keys or material listed on the questions that students have not studied, and illustrations of reading that are difficult for students to understand. However, on the whole it can be concluded that the items in the Middle Semester Exam (UTS) Science SMP Negeri 5 Bengkulu City for the 2018/2019 academic year have very good quality questions.

CONCLUSION

Based on the results of the research that has been done before, it can be concluded that the difficulty level of items for Class VII and VII at SMP Negeri 5 Bengkulu City has a category of difficult questions in grade VII which is only 10%, the easy question category is 15%, and the category questions that are currently 75%. Likewise, Class VIII has only 5% difficult question categories, 10% easy question categories, and 85% medium question categories. This indicates that the quality of the UTS questions is very good.

The author hope that with an article about analysis of the item difficulty index for midterm examinations in junior high schools 5 bengkulu city, this research can improve the ability of teachers to analyze the items and it would be nice if the school is willing to provide training for teachers so that the questions will be of higher quality and be able to measure the level of students' critical thingking skills in answering questions.

Acknowledgements

References

Arikunto, S. (2009). *Dasar-dasar Evaluasi Pendidikan (edisi revisi)*. Jakarta: Bumi Aksara.

Ariyana, L. T. (2011). *Analisis Butir Soal Ulangan Akhir Semester Gasal IPA Kelas IX SMP di Kabupaten Grobogan (Doctoral dissertation, Universitas Negeri Semarang)*.

Amalia, A. N., & Widayati, A. (2012). *Analisis butir soal tes kendali mutu kelas XII SMA mata pelajaran ekonomi akuntansi di kota Yogyakarta tahun 2012*. Jurnal Pendidikan Akuntansi Indonesia, 10(1).

Anita, A., Tyowati, S., & Zuldafrial, Z. (2018). *Analisis kualitas butir soal fisika kelas x sekolah menengah atas*. Edukasi: Jurnal Pendidikan, 16(1), 35-47.

Daryanto. (2010). *Evaluasi Pendidikan*. Jakarta : Inventions.

Hasibuan, E. S. B. (2013). *Analisis Soal Ulangan Tengah Semester Bahasa Indonesia Kelas Xii Mas Raudhatul Ulum Meranti*. Jurnal Pendidikan dan Pembelajaran Khatulistiwa, 2(4).

Kunandar. (2015). *Penilaian Autentik*. Jakarta : PT. Raja Grafindo.

Lufri dan ardi. (2014). *Metodologi Pendidikan*. Padang : UNP Press.

Maulida, M., Muhibbuddin, M., & Yusrizal, Y. (2015). *Analisis Indeks Kesukaran Dalam Pengembangan Item Tes Pada Konsep Sel Tingkat Sekolah Menengah Atas*. Jurnal Edubio Tropika, 3(1).

Mujib, N. R., Toenlioe, A. J., & Praherdhiono, H. (2018). *Analisis Butir Soal Ujian Nasional Ipa SD/MI Tahun 2015 Sampai 2017 Berdasarkan Taksonomi Bloom*. Jurnal Kajian Teknologi Pendidikan, 1(2), 149-158.

Muluki, A. (2020). *Analisis Kualitas Butir Tes Semester Ganjil Mata Pelajaran IPA Kelas IV Mi Radhiatul Adawiyah. Jurnal Ilmiah Sekolah Dasar*, 4(1), 86-96.

Purnomo, A. (2007). *Kemampuan guru dalam merancang tes berbentuk pilihan ganda pada mata pelajaran ips untuk ujian akhir sekolah (UAS)*. Lembaran Ilmu Kependidikan, 36(1).

Rahmawati, O. *Analisis Butir Soal Matematika pada UKA PLPG LPTK Fakultas Tarbiyah IAIN Antasari Banjarmasin*.

Septiana, N. (2016). *Analisis butir soal ulangan akhir semester (UAS) biologi tahun pelajaran 2015/2016 kelas X dan XI pada MAN Sampit*. Edu Sains: Jurnal Pendidikan Sains dan Matematika, 4(2).

Sudjana, N., & *Mengajar, P. H. P. B*. (2005). Remaja Rosdakarya.

Sudjiono, A. (2011). *Pengantar evaluasi pendidikan*. Jakarta: Rajawali Pers.

Sugiono, S. (2016). *Metode penelitian kuantitatif, kualitatif, dan r & d*. Bandung: Alfabeta.

Sumiati, A., Widiastuti, U., & Suhud, U. (2018). *Workshop Teknik Menganalisis Butir Soal dalam Meningkatkan Kompetensi Guru di SMK Cileungsi Bogor*. Jurnal Pemberdayaan Masyarakat Madani (JPMM), 2(1), 136-153.

Sudijono, A. (2015). *Pengantar evaluasi pendidikan*. Jakarta : Raja Grafindo Persada