

## Profile of HOTS ability (High Order Thinking Skill) level analysis of biological materials for SMA/MA students in-Banten Province

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Article information	ABSTRAK
Article history:	Banten merupakan salah satu provinsi di Indonesia dengan kualitas pendidikan yang belum dikatakan baik. Salah satu penyebab rendahnya kualitas pendidikan adalah rendahnya kemampuan berpikir yang dimiliki oleh siswa. Penelitian ini bertujuan untuk mengetahui kemampuan HOTS
Received April 29, 2021	( <i>high order thinking skill</i> ) level analisis materi biologi siswa SMA/MA di Provinsi Banten menggunakan soal uraian. Metode penelitian kualitatif dilakukan dengan pendekatan fenomenologis. Teknik pengambilan sampel sekolah yang digunakan dengan <i>random sampling</i> . Responden adalah siswa kelas XII dari sekolah sampel yang berada di Provinsi Banten. Instrumen yang digunakan adalah soal uraian kemampuan analisis, lembar wawancara dan lembar angket. Penelitian dilakukan dari bulan Maret sampai November 2020. Berdasarkan hasil penelitian, kemampuan analisis siswa di Provinsi Banten berada dalam kategori kurang dan sangat kurang.
Revised Dec 13, 2021	
Accepted Dec 27, 2021	
Kata kunci:	
HOTS	
Kemampuan analisis	
Materi biologi	
SMA/MA Provinsi Banten	
	ABSTRACT
Keywords:	Banten is one of the provinces in Indonesia with the quality of education that has not been said to be good. One of the causes of the low quality of education is the low thinking ability of students. This research aimed to determine the HOTS (high order thinking skill) ability analytical skill of biology material for SMA/MA students in Banten Province by used description question. The research method used is descriptive qualitative. The sampling technique used in this study was random sampling. The sample used was 320 students in Banten Province. The instrument used was a description of the analytical skills, interview sheets and questionnaire sheets. The research was conducted from March to November 2020. Based on the results of the research, the average analytical ability of students in Banten Province was in the less category with a score of 22,19.
HOTS	
Analytical skills	
Biology material	
SMA/MA in Banten Province	

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### INTRODUCTION

Indonesia is included in the group of countries with low categories in the field of education, especially in the field of science. This is in line with Widodo's (2015) statement that the quality of

education in Indonesia is currently low, which illustrates that the quality of human beings in Indonesia is still far below expectations. The low quality of education in Indonesia can be seen from the results of the program for international student assessment (PISA) study which ranks 8th bottom out of 77 countries in the world in terms of student abilities in aspects of science, language and mathematics (OECD, 2019). Based on research conducted by Raharjo (2012) that the ability of students to receive subject matter is still not optimal so that educational standards have not been achieved, this causes the quality of Indonesian education is still low. The low quality of education in Indonesia shows that every region in Indonesia does not yet have good quality education. Indonesia currently has 34 provinces, one of which is Banten Province. Banten is one of the provinces in Indonesia with the quality of education that has not been said to be good. The quality of education in Banten can be seen from the results of the national examination of students who are ranked 12th out of 34 provinces in Indonesia (Kemendikbud, 2019). Banten ranks the lowest average in the acquisition of national exam scores for the Java region.

One of the causes of the low quality of education is the low thinking ability of students. Permanasari, et al. (2013) stated that the learning process in Indonesia is still weak because students are not encouraged to develop their thinking skills. One of the thinking skills that must be possessed by students is analytical skills. According to Winarti (2015) analyzing is an important part of higher order thinking skills. According to Anderson and Krathwohl (2001) analysis is a breakdown of the main parts and connecting these parts with other relevant parts. Analytical ability is a supporting factor in the learning process. According to Novita et al. (2016) students who have low analytical skills will hinder their learning process.

Analytical ability doesn't only affect the learning process, but also affects student achievement. Based on the research of Mahmudah et al (2014) students who have high analytical skills are better able to solve problems and have a greater curiosity about something being studied. Furthermore, according to research conducted by Annas et al (2016) there is a significant positive correlation between analytical ability and student achievement.

Good analytical skills need to be possessed by students in every lesson in order to be able to understand the lesson well, including biology material. According to Norhasanah (2018), biology is a science that requires thinking skills and abilities because in biology lessons there are demands to carry out work procedures and scientific work to explain a process and produce a product. In biology, there are also problems related to everyday life that must be solved. Astriani, et al. (2017) stated that analytical skills are important to solve a problem so that the right decision can be taken.

Making the right decisions also needs to be applied in everyday life to reflect an educated student. According to Brookhart (2010), an educated person is someone who can understand societal, personal, and professional issues and decide what to do. Therefore, to reflect educated students, analytical skills are needed that can be applied to learning and in everyday life. Based on this description, students' analytical skills need to be known by conducting research on the HOTS ability profile at the level of biological material analysis for SMA/MA students in Banten Province.

## **METHOD**

The method used in this research is a phenomenological approach. The research design used is the phenomenological research design according to Bandur (2016) with the stages of selecting individuals to be studied, selecting special situations, collecting data, carrying out description procedures, analyzing data, and presenting the results of data analysis. The research subjects were SMA/MA class XII science students and biology class XII teachers. The time of the study was carried out from March to November 2020. The research locations were conducted in sample schools in Banten Province.

The types of data collected are qualitative and quantitative data. The data included in the qualitative data in this study were the results of interviews with teachers and the results of student questionnaires. Quantitative data needed in this study is the number of students and the results of the measurement of students' analytical ability tests.

The data sources used are 16 schools in Banten Province which were selected using random sampling technique. The research subjects were students in class XII in the sample schools in the 2019/2020 school year. There were 20 students who were the research subjects from each school, so the total number of students who became the research subjects were 320 students in Banten Province. The average number of students in class XII at each school in Banten is 200 students. Research subjects as many as 20 people from each school are assumed to have met as 10% of the population.

The data collection technique used is a survey technique using test and non-test instruments. The validity of the data was tested by using the credibility test of the data or the trustworthiness of the research data. The type of credibility test used is source triangulation. Some of the sources used include the results of interviews with teachers, questionnaires given to students and the results of students' analytical ability tests.

Data analysis was carried out by interactive analysis according to Miles and Huberman (2014). This data analysis technique consists of three streams of activities that occur simultaneously, namely data reduction, data presentation, conclusion drawing/verification.

**RESULTS AND DISCUSSION**

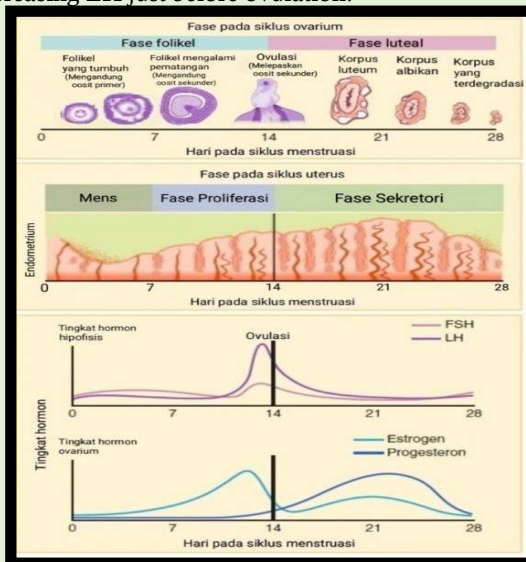
This study aims to determine the analytical ability of SMA/MA students in Banten Province. Students' analytical ability is measured using a description of the problem. This research was conducted in 16 schools in Banten Province which were selected randomly (random sampling). The random sampling technique was carried out because every student in Banten Province had the same opportunity to become a respondent. This is because students study the material with the same Basic Competence (KD).

Students' ability to analyze can be seen from the results of students' answers to the description questions given. The question consists of three questions that include indicators of the ability to analyze including distinguishing, connecting and analyzing. The questions given are material for class XI in KD 3.5 and KD 3.12. The two KDs become a reference in measuring students' analytical skills because in both KDs students are required to solve various problems related to everyday life.

Table 1. contains indicators of higher order thinking skills and questions used as instruments for data collection on students' ability to analyze material.

**Table 1.** Instruments about analytical skills

No	Indicator	Question
1.	Differentiate	Study the chart below, explain the difference in effect that occurs between increasing estrogen and increasing LH just before ovulation!



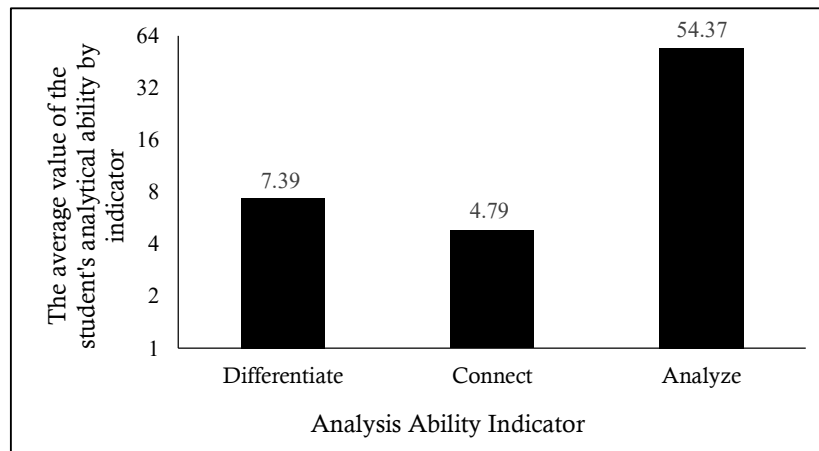
2.	Connect	Based on graph number 1, it can be concluded that the change from the corpus luteum to the corpus albicans can cause the menstrual phase to occur, why is that? Explain!
3.	Analyze	A soccer player suffers an injury with symptoms of muscles becoming hard and tense during the game. What muscle disorder does the soccer player suffer from? Judging from the activities of the soccer players, why did this happen? What can be done to prevent it?

Based on the answers given by the research subjects, data analysis was carried out on students' analytical abilities. The analysis was carried out by calculating the students' scores and then categorized. According to Purbaningrum (2017) the category of higher order thinking skills can be divided into five categories. The categories of higher order thinking ability levels can be seen in Table 2.

**Table 2.** The categories of higher order thinking ability levels

Student scores	Ability Level
81-100	Very Good
61-80	Good
41-60	Enough
21-40	Less
<20	Very Less

The analytical ability of students obtained is different on each indicator of ability. The abilities that are indicators of this analytical ability include the ability to distinguish, relate, and analyze. The average value of the analytical ability of Banten Province students per indicator can be seen in Figure 1.

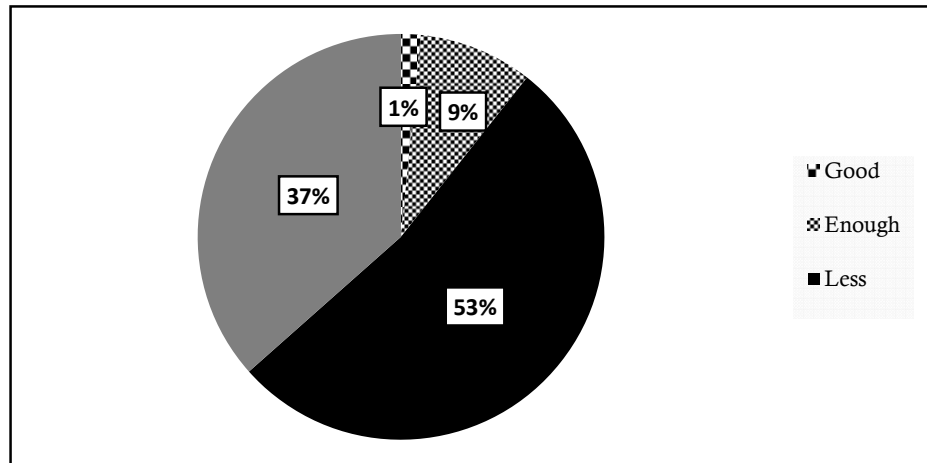


**Figure 1.** Student analysis ability by indicator

Based on Figure 1, the analytical ability of Banten Province students on differentiating indicators got an average score of 7.39 with a very poor category. The ability of students to distinguish the information contained in the graph is still very lacking. According to Anderson and Krathwohl (2001) the basic ability to analyze is a distinguishing indicator. Distinguishing indicators require students to be able to distinguish important and unimportant, relevant and irrelevant information and adjust the section as a whole. Seeing this statement is inversely proportional to the results obtained because the differentiating indicators get very poor scores.

The linking indicator obtained an average value of 4.79 where the average linking indicator was the lowest when compared to distinguishing and analyzing indicators. The lack of students' ability to distinguish is a factor that makes the ability to connect has the lowest score compared to other indicators. According to Anderson and Krathwohl (2001) linking indicators are the basis for concluding the material presented. When students have low connecting skills, it means that students have not been able to give conclusions on the material presented.

The analysis indicator obtained an average value of 54.37 with a sufficient category. The analyzing indicator has a higher score than the other two indicators. The results of interviews with biology teachers revealed that the cause of the low analytical ability of students was because students were not used to working on analytical questions, the teacher only gave practice questions with low cognitive levels, namely levels C1 to C3. Overall the results of the percentage of students based on the analytical ability category are shown in Figure 2.



**Figure 2.** Category of student analysis ability

Based on Figure 2. the percentage of students based on the analytical ability category in Banten Province is in the good, sufficient, less and very poor categories. The data was obtained from the results of the calculation of students' analytical abilities which were categorized according to Purbaningrum (2017). Based on the calculation of the results of students' analytical skills, from 320 students as many as 5 students were in the good category, 29 students were in the sufficient category, 169 students were in the poor category and as many as 117 students were in the very poor category.

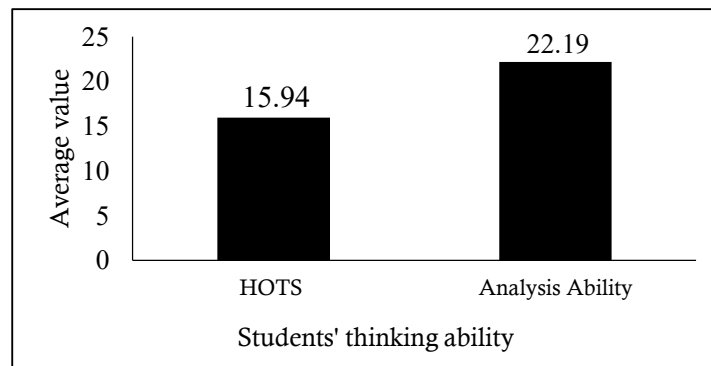
The score of students' analytical ability in Banten Province is obtained from the results of the calculation of the average analytical ability of students in each district or city in Banten Province which is shown in Table 3. Overall, the average analytical ability of students in Banten Province is in the poor category with a score of an average of 22.19. South Tangerang City got the highest score of analytical ability in Banten Province with a score of 30. Serang City got the lowest score of student analytical ability in Banten Province, namely 14.44.

**Table 3.** Results of student analysis ability of Banten Province

District/City	Value of Analysis Ability	Category
Lebak District	23.61	Less
Pandeglang District	17.22	Very Less
Cilegon City	27.78	Less
Serang City	14.44	Very Less
Serang District	18.89	Very Less
Tangerang District	23.61	Less
Tangerang City	21.94	Less
South Tangerang City	30	Less
The average analytical ability of students in Banten Province	22.19	Less

Based on table 3, it can be seen that the analytical ability of students in Banten Province is still far from good category. The low analytical ability of students is caused by students not being able to understand every material in biology learning. Students' understanding is still low because students are only used to working on questions with low cognitive levels, namely only at levels C1, C2 and C3. Questions at levels C1 to C3 are included in the LOTS (Lower Order Thinking

Skill) question group, where LOTS questions make students have a poor understanding of concepts. Sanjaya (2009) said that students have a good understanding of concepts when students are not just remembering and memorizing, but students are able to re-express the material learned in other forms that are easy to understand. The questions that are classified as LOTS questions only make students able to remember and memorize so that understanding of the concept is still very lacking. Students need to be accustomed to working on higher order thinking questions (HOTS) which can help students hone their thinking skills. According to Saraswati (2020) HOTS is a student's thinking ability which is not only remembering but also expected to be able to develop thinking skills. In addition to the low analytical ability of students, the HOTS ability of students in Banten Province which includes the levels of analysis, evaluation and creation also has a very low score. The comparison of the average analytical ability with the average HOTS of students in Banten Province can be seen in Figure 3.



**Figure 3.** Comparison of student analysis ability scores and HOTS of students in Banten Province

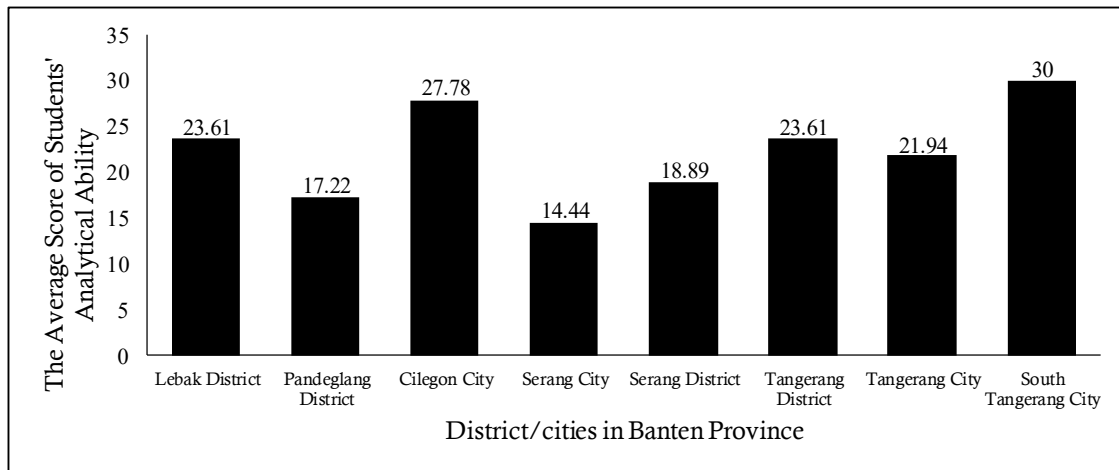
Based on the research results shown in Figure 3, the higher order thinking ability (HOTS) of students in Banten Province has an average score of 15.94 with a very poor category. The high order thinking ability (HOTS) scores of students who are still lacking are obtained from the results of the HOTS question instrument which has been distributed in 16 schools throughout Banten Province. When compared with the analytical ability of students in Banten Province, the average HOTS score is not much different from the average score of analytical ability. This shows that there is a match between the average analytical ability of students and the average HOTS of students in Banten Province because analytical ability is one level of higher order thinking ability (HOTS).

In addition, students are not accustomed to working on higher-order thinking questions, teachers are not accustomed to making HOTS questions. The teacher's ability to make HOTS questions is important. Making HOTS questions can measure abilities such as transferring one concept to another, processing and applying information, looking for connections from a variety of different information, using information to solve problems, and examining ideas and information critically (Lestari, 2020). In fact, as many as 50% of teachers have never made HOTS questions themselves, teachers use HOTS questions obtained from UN questions, Olympic questions or other websites. This is the effect of the low level of high-order thinking skills of students, because teachers have an important role to optimize students' thinking skills. According to Pratiwi (2019), teachers need to have a good understanding of low-level thinking skills (LOTS) and higher-order thinking skills (HOTS) to develop good HOTS abilities for students. Furthermore, Widana (2017) states that teachers play a role in improving HOTS assessments both in daily tests, end-of-semester assessments, and school exams.

The results of the student's analytical ability test showed that on average students could not answer question number one and question number two which were presented in graphical form. Students have less ability to read and understand the contents of the graph. The results of the questionnaire that has been given to students show that as many as 77.5% of students find it difficult to work on graphic questions and as many as 48% of students do not like questions in graphic form. In line with that, based on the results of interviews with biology teachers, it can be

concluded that only a small number of students are able to do analytical questions because previously students were not used to working on analytical questions. As many as 57% of students were only able to answer question number 3 which contained story analysis questions. The use of graphic questions should make it easier for students to answer the questions given. Rahman, et al. (2018) stated that data presented in graphical form is easier to understand than data presented in description form.

The lack of student analytical skills in Banten Province illustrates that every student in a district or city in Banten Province still has analytical skills that are still far below expectations. Banten Province currently has eight regencies or cities. The analytical ability of SMA/MA students in each district/city in Banten Province can be seen in the following graph:



**Figure 4.** Student analysis ability of the district/city of Banten Province

Based on Figure 4, the analytical ability of students in Banten Province only occupies two categories, namely less and very less. The district/city that has the highest student analytical ability is in South Tangerang City with a score of 30, while the lowest student analytical ability is in Serang City with a score of 14.44. Total of five districts/cities in Banten Province are in the poor category because they have an analysis score between 21 to 40, including Lebak district, Cilegon City, Tangerang district, Tangerang City and South Tangerang City. Meanwhile, Serang district, Serang City and Pandeglang district have analytical skills in the very poor category with a score of less than 20.

South Tangerang City obtained the highest average analytical ability score in Banten Province. The results of interviews with teachers show that students have been trained to work on analytical questions, although not often. Students are given analytical questions depending on the demands of the learning material. In line with that based on the results of the questionnaire, students said that in learning biology students were accustomed to working on practice questions to the level of analyzing. The learning models and methods used in the sample schools in South Tangerang City also support students' analytical skills. According to Qomariya et al. (2018) analytical skills can be achieved if the models and methods used support the learning process. Based on the results of interviews with teachers, schools have implemented an inquiry learning model, where the inquiry learning model supports students' analytical skills. This is in accordance with the statement of Qomariya (2018) that the learning model that supports analytical skills in learning is the inquiry model, where students can find their own answers to the questions asked. Another factor that affects the analytical ability of students in South Tangerang City is higher than other districts/cities, the sample schools in South Tangerang City have good quality education. This can be seen from the value of the school's accreditation as the research sample. The two schools that were sampled in the study in South Tangerang City had an A accreditation predicate. According to Zulnika (2017) school accreditation has a very large role in educational institutions, one of which has an impact on the teaching and learning process in schools.

Serang City got the lowest category of students' analytical ability scores in Banten Province. The low analytical ability of students in Serang City is caused because students are not accustomed to working on analytical questions. Based on the results of teacher interviews, students were only accustomed to working on questions at a low cognitive level, namely at C1 (knowing) and C2 (understanding). Students have never been trained to work on questions up to the level of analysis. In line with that based on the results of the questionnaire, students said that in biology learning they were rarely given questions with the type of analysis. As many as 90% of students also said that they had difficulty working on analytical questions. According to research conducted by Arifin and Retnawati (2017), in order for students' higher order thinking skills (HOTS) to develop well, students need to be accustomed to measuring HOTS, otherwise the potential for HOTS in students does not develop.

Based on the results of teacher interviews, the learning model applied to the sample schools in Serang City is the Discovery learning model. According to Novita et al. (2016) the Discovery Learning learning model can improve students' analytical skills even though the Guided Discovery Learning model is better than Discovery Learning. The learning model used at the school supports students' analytical skills, but in its application it is not associated with analyzing questions. Another factor that affects the analytical ability of Serang City which is at the bottom in Banten Province is the predicate of school accreditation. In contrast to South Tangerang City, one of the schools that became the research sample in Serang City has an A accreditation while another school has a B accreditation predicate. Based on research conducted by Zulnika (2017), there is a significant influence between school accreditation on the quality of student learning.

Overall, based on the results of teacher interviews, they said that the learning model used in biology learning already supports students' analytical skills, namely Discovery Learning and Inquiry. The learning method that is often used by teachers during the learning process is the discussion method. Based on student information on the results of the questionnaire, discussion and question and answer methods are often done during learning. According to research conducted by Marpaung (2018) the discussion method can make it easier for students to understand the material. This statement shows that the models and learning methods used in the schools that are the research sample have been supportive in improving students' analytical skills.

The cause of the low analytical ability of students is that students are not accustomed to working on analytical questions, students are only accustomed to working on questions with a low cognitive level, namely levels C1 (knowing) to C3 (applying) which is a matter of LOTS (Lower Order Thinking Skill). According to Supandi's (2019) research students can experience difficulties during the learning process if they are not familiar with the learning process used. In addition, teachers who are not accustomed to giving analytical questions are also not accustomed to making their own analytical questions. As many as 50% of the biology teachers who were the research sample in Banten Province never made their own analytical questions. This is in line with research conducted by Retnawati (2018), teacher knowledge about HOTS, teacher ability to improve student HOTS and teacher activities measuring student HOTS is still low.

The results of the interviews showed that not all students were able to work on analytical questions, only some students were able to work on analytical questions. This is in line with the results of student questionnaires where as many as 77.5% of students find it difficult to do analytical questions. The teacher's and student's statements support the results of students' analytical skills in Banten Province which shows that the average student's analytical ability is in the poor category. Students have not met the indicators of analyzing, namely distinguishing, connecting and analyzing.

## CONCLUSION

Based on the results of the study, it can be concluded that the analytical ability of Banten Province students is included in the poor category with a score of 22.19 from a maximum score of 100. The district/city that has the highest student analytical ability is South Tangerang City with a score of 30, while the student's analytical ability is the highest. The lowest was in Serang City with a score of 14.44. The analytical ability of students in Banten Province only occupies



two categories, namely the poor category and the very poor category. Five regencies/cities are in the poor category while 3 regencies/cities are in the very poor category. Students' low analytical skills need to be improved by getting used to learning activities that hone students' abilities to distinguish, connect and analyze as well as train students to work on analytical questions.

## REFERENCES

- Anderson, L.W & D.R. Krathwohl. (2001). *Taxonomy for learning, teaching, and assessing a revision of bloom's taxonomy of educational objective*. New York: Addison Wesley Lonman Inc.
- Annas, A., Ashadi & Haryono. (2016). Kontribusi Kemampuan Memori dan Kemampuan Analisis Siswa terhadap Prestasi Belajar Materi Koloid di SMA Muhammadiyah 1 Karanganyar Tahun Pelajaran 2015/2016. *Jurnal Pendidikan Kimia (JPK)*, 5 (4), 8-15
- Arifin, Z., & Retnawati, H. (2017). Pengembangan Instrumen Pengukur Higher Order Thinking Skills Matematika Siswa SMA Kelas X. *PYTHAGORAS, Jurnal Pendidikan Matematika*, 12(1), 98-108.
- Astriani, D., H. Susilo., H. Suwono & B. Lukiati. (2017). Profil Keterampilan Berpikir Analitis Mahasiswa Calon guru IPA dalam Perkuliahan Biologi Umum. *Jurnal Penelitian Pendidikan IPA*, 2(1), 66-70
- Bandur, A. (2016). *Penelitian Kualitatif Metodologi, Desain, dan Teknik Analisis Data dengan NVIVO 11Plus*. Jakarta: Mitra Wacana Media
- Brookhart, S.M. (2010). *How to Assess Higher-Order Thinking Skills in Your Classroom*. Virginia USA: ASCD
- Kemendikbud. (2019). Laporan hasil ujian nasional. Pusat Penilaian Pendidikan. <https://hasilun.puspendik.kemdikbud.go.id/#2019!sma!capaian!99&99&999!T&T&T&T&1&1!&>
- Lestari, I.D. (2020). Kemampuan Mahasiswa Calon Guru Pendidikan Biologi Untirta dalam Pembuatan Soal Higher Order Thingking Skill (HOTS). *Prosiding Seminar Nasional Pendidikan FKIP*, 3(1), 126-128.
- Mahmudah, L., Suparni & S. Widha. (2014). Pembelajaran Fisika Menggunakan Metode Pictorial Riddle dan Problem Solving ditinjau dari Kemampuan Berpikir Kritis dan Kemampuan Analisis. *Jurnal Inkuiri*, 3(2), 48-59
- Marpaung, D. (2018). Penerapan Metode Diskusi dan Presentasi untuk Meningkatkan Minat dan Hasil Belajar Siswa di Kelas XI IPS-1 SMA Negeri 1 Bagan Sinembah. *School Education Journal*, 8(4), 360-368
- Miles, M.B. & A.M. Huberman. (2014). *Analisis Data Kualitatif*. Jakarta: UI Press
- Norhasanah. (2018). Kemampuan berpikir kritis siswa SMA dalam pembelajaran biologi. *Jurnal Pembelajaran Biologi*, 5(1), 105-109.
- Novita, S., S. Santosa & Y. Rinanto. (2016). Perbandingan kemampuan analisis siswa melalui penerapan model cooperative learning dengan guided discovery learning. *Proceeding Biology Education Conference*, 13(1), 359-367
- OECD. (2019). *Programme for International Student Assessment (PISA) Result from PISA 2018*. [www.oecd.org/pisa](http://www.oecd.org/pisa).
- Permanasari, V., B. Sugiarto & I. Kurniawati. (2013). Efektivitas Pendekatan Pembelajaran Open-Ended terhadap Kemampuan Berpikir Matematis Siswa pada Materi Trigonometri Ditinjau dari Kreativitas Belajar Matematika Siswa. *Jurnal Pendidikan Matematika Solusi*, 1(1), 31-38
- Pratiwi, N. P. W., N. L. P. E. S. Dewi., & A. A. G. Y. Paramartha. (2019). The Reflection of HOTS in EFL Teachers ' Summative Assessment. *Journal of Educational Research and Evaluation*, 3(3), 127-133.
- Purbaningrum, K.A. (2017). Kemampuan Berpikir Tingkat Tinggi Siswa SMP dalam Pemecahan Masalah Matematika Ditinjau dari Gaya Belajar. *JPPM*, 10 (2), 40-49
- Qomariya, Y., L.K. Muharrami., W.P. Hadi & I. Rosidi. (2018). Profil Kemampuan Berpikir Analisis Siswa SMP Negeri 3 Bangkalan dengan Menggunakan Metode Pictorial Riddle dalam Pembelajaran Inkuiri Terbimbing. *Journal Trunojoyo*, 1(1), 9-18
- Raharjo, S.B. (2012). Evaluasi Trend Kualitas Pendidikan di Indonesia. *Jurnal Penelitian dan Evaluasi Pendidikan*, 16 (2), 511-532

- Rahman, R., Meliyana & I. Rifqiawati. (2018). Pengaruh Model Pembelajaran Process Oriented Guided Inquiry Learning (POGIL) terhadap Kemampuan Komunikasi Siswa pada Subkonsep Urinaria Kelas XI di MA. *Jurnal Pendidikan Biologi*, 9(2), 132-143
- Retnawati, H., H. Djidu., A.E. Kartianom & R.D.Anazifa. (2018). Teachers' knowledge about higherorder thinking skills and its learning strategy. *Problems of Education in the 21st Century*, 76(2), 215– 230
- Sanjaya, W. (2009). *Strategi Pembelajaran Berorientasi Standar Proses Pendidikan*. Prenada: Jakarta
- Saraswati, P.M.S & G.N.S. Agustika. (2020). Kemampuan Berpikir Tingkat Tinggi dalam Menyelesaikan Soal HOTS Mata Pelajaran Matematika. *Jurnal Ilmiah Sekolah Dasar*, 4(2), 257-269
- Supandi. (2019). Upaya Meningkatkan Keterampilan Proses Sains Siswa pada Konsep Pertumbuhan dan Perkembangan Tumbuhan melalui Model Pembelajaran Guided Inquiri. *Jurnal Biologi dan pembelajarannya*, 14(1), 14-21.
- Widana, I. W. (2017). Higher Order Thinking Skills Assessment (HOTS). *Jisae: Journal of Indonesian Student Assesment and Evaluation*, 3(1), 32-44.
- Widodo, H. (2015). Potret Pendidikan di Indonesia dan Kesiapannya dalam Menghadapi Masyarakat Ekonomi Asia (MEA). *Cendikia*, 13(2), 293-307
- Winarti. (2015). Profil kemampuan berpikir analisis dan evaluasi mahasiswa dalam mengerjakan soal konsep kalor. *Jurnal Inovasi dan Pembelajaran Fisika*, 2(1), 19-24
- Zulnika. (2017). Pengaruh Akreditasi Sekolah dan Kinerja Guru terhadap Mutu Pembelajaran Siswa SMP Negeri di Kecamatan Kopang. *Jurnal Ilmiah Profesi Pendidikan*, 2(2), 222-227.