A Technology-Based Learning Needs Analysis to Improve Higher Order Thinking Skills (HOTS) of Elementary School Students

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Abstract. The rapid of science and technology requires development in the education being able to adapt to the changes. During the industrial revolution 4.0, education was directed at developing 21st century competencies that is consisted of four skills that students must possess and also referred to as 4C Skills. 4C Skills competencies include critical thinking (critical thinking), communication (communication), teamwork (collaboration), and creativity (creative). Students at the elementary school level are taught higher order thinking skills from a younger age. Higher order thinking skills include critical, logical, introspective, metacognitive, and creative thinking. Students not only learn to memorize and understand lessons, but through HOTS competencies are also expected to be able to analyze, evaluate, and create at a deeper level. HOTS is a complex learning and requires logic, reasoning, analysis, judgment, discovery, problem solving, and decision making. Elementary school students' HOTS can be increased by utilizing various learning media, for instance learning videos, e-books, and websites. By using a more interesting learning approach, educational media is intended to attract students' attention and encourage their involvement in the learning process.

Keywords: Higher Order Thinking Skill, HOTS, higher order thinking skills, technology-based learning, Elementary School

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INTRODUCTION

The rapid of science and technology demands the development of adaptation skills. Jack Ma, CEO of Alibaba Group, noted at the 2018 World Economic Forum annual meeting that the world of education in the era of the Industrial Revolution 4.0 provides a significant challenge for educators. If instructor does not change the way they teach and educate their students, the global community will be in danger in thirty years. In the past, the school system did not educate the skills and mindset needed to compete with machines and robotics. During the Industrial Revolution 4.0, education was directed at the development of 21st-century competencies, which consisted of four skills that students must have and also referred to as 4C skills (Rachmadtullah et al., 2020). 4C competencies include critical thinking, communication, collaboration, and creativity. Critical thinking requires the capacity to analyze problems and find solutions for them through knowledge. Students are asked to communicate ideas or concepts based on past literacy tasks if they have communication skills. Student collaboration skills are evaluated based on their ability to exchange knowledge and experience when completing assignments or doing projects with others. While the creative skills in question are the ability of students to produce goods, services, or discoveries that are efficient, practical, straightforward, and user-friendly (Kurniawan et al., 2020). The ability to think is in line with the argument for improving the quality of education through learning methods that meet the objective requirements (Chrisyarani & Setiawan, 2021). Nowadays Indonesian education is currently undergoing several reforms, including the implementation of the 2013 curriculum which replaces the KTSP curriculum (Febriyanto et al., 2019). Furthermore, Indonesia began to implement a new curriculum, the independent curriculum (Kurikulum Merdeka) which is also oriented towards 4C skills.

In the 2013 curriculum (K-13), students are required to have 5 skills (Widiawati et al., 2018). Observing, asking, getting information, associating, and communicating. Thinking capacity continues to be developed through teaching so that students are accustomed to scientific reasoning. The scientific approach is implemented to the learning of integrated themes in the K-13. In other words, the implementation of integrated thematic learning combines several disciplines into certain themes (Erita et al., 2020). Following this, changes in the 2013 curriculum

and followed by an independent curriculum demand that children of basic education develop high-level thinking skills or high-order thinking skills from an early age. Critical thinking, logical, introspective, metacognitive, and creative are examples of high-level cognitive abilities. HOTS is an important skill obtained by children not only to remember and understand, but also to analyze, evaluate, and create (Sole & Anggraeni, 2020). HOTS is a complex ability that requires logic, reasoning, analysis, assessment, discovery, problem-solving, and decision-making.

Hots is essential for the 21st century. Therefore, HOTS is an important skill that must be included in the national education system, because it promotes sustainable learning and provides future benefits for the nation (Ghanizadeh et al., 2020). However, statistics show that HOTS is still relatively low. Students are not accustomed to training, evaluation, and make-creation skills. This can be seen from the results of class observations in several public elementary schools in several sub-districts in the city of Surakarta. Some of the learning provided by the instructor is only focusing on material books, giving questions without considering the types of questions with operational verbs C4, C5, or C6. The intensity of the use of learning media is still lacking. The instructor also provides more conventional learning material like lectures.

Furthermore, the results of interviews with several class instructors also showed opinions in line to strengthen the results of class observations. Many instructors in classes V and VI still do not understand HOTS, both its principles and their application. They agreed that when giving questions to students did not pay attention to the cognitive level. Some instructors find it difficult to provide learning that can stimulate high-level thinking skills in students. On the other hand, the score of midterm assessment test results which contains HOTS questions shows that the critical thinking skills of elementary school students are still low. The number of students under the minimal criteria dominates. The average percentage of several public elementary schools is still below 40% which has a value above KKM with a value of 70.

The survey findings were strengthened by research conducted by Saraswati & Agustika (2020) which showed that the fifth-grade students of SDN 1 Padang Sambian can think of moderate to low HOTS. This is also following research conducted by Ichsan et al. (2020) which reveals that the score of the hOTS of elementary school children is still very low. Based on the research findings of Fajriyah & Agustini (2018), the level of the ability of HOTS of class V SD students is still in the range below standard.

To deal with this, instructors can apply assessments using technical progress to make technology-based material that improves students' HOTS skills. This is because technological advances have a direct impact on teaching and learning skills technology users, namely students and instructors. Researchers are interested in studying the need for technology-based learning to improve High Order Thinking Skills (HOTS) in elementary students based on the description of the problems.

METHOD

The study applies the literature review method that is reviewing the results of related research, books, or journals that raised themes and topics regarding technology-based learning needs analysis and improving HOTS abilities in elementary school students.

RESULTS AND DISCUSSION

High Order Thinking Skills (HOTS)

High-order thinking based on Bloom's Taxonomy can be defined as a base in higher-order thinking. It is because some forms of learning involve more cognitive work than others, but offer a wider range of benefits. In Bloom's Taxonomy, skills that are classified as High Order Thinking Skills are abilities that involve analyzing, evaluating and creating something. HOTS is essential for students to master from an early age. So, it can be concluded that High Order Thinking Skills are a higher-order thinking process than just remembering facts or explaining what has been learned to others. However, HOTS requires students to understand, draw conclusions, connect facts with concepts, categorize, manipulate, look for facts in an event that occurs, and solve problems that occur. HOTS has characteristics alike as being non-algorithmic, complex, generating many solutions, involving differences of opinion or interpretation, involving applying certain criteria,

involving uncertainty, requiring independence in thinking processes, involving deep meaning, and requiring hard work. (Sole & Anggraeni, 2020).

Instructors must integrate HOTS into the learning process. It is to improve students' critical thinking levels (Pulungan et al., 2021). HOTS is an essential component of creative and critical thinking and a creative thinking methodology that helps students generate more inventive ideas, ideal views, and imaginative insights. By teaching students at HOTS, they will test students' talents and ways of thinking. (Hidayah et al., 2021).

Someone is considered to have high-level cognitive abilities if he shows indicators that indicate higher-order thinking skills or HOTS. According to Krathwohl (in Pradani et al., 2021), several indicators can be used to measure students' ability to think critically, which can be explained as follows.

i) Analyze, can be interpreted as the ability of students to break down the material into its basic parts and identify how a part is connected with other parts of information or material. Analyze indicators include:

a. Differentiating, is an ability that is seen when students can distinguish between irrelevant and relevant elements or between important parts from unimportant parts of a given information or material.

b. Organizing, is the ability of students to determine whether some of the pieces of the structure are suitable and can be used together.

c. Connecting, is an ability that is seen when students can distinguish the content of the topic of the subject matter provided and can take the necessary cores.

ii) Evaluating, is the ability of students to make decisions based on predetermined standards, where evaluating indicators consist of:

a. Checking, is the ability of students to identify discrepancies in processes or results, identify procedures or results that have internal consistency or can assess the level of effectiveness of the efficacy of a predetermined technique.

b. Criticizing, is the ability of a student to identify contradictions between results and external criteria or conclusions that are consistent with the specified problem process.

iii) Creating, is the student's ability to unite components to form a coherent unit to produce original results, such as compiling, planning, or producing something.

a. Generating, is the ability of students to identify hypotheses based on established criteria.

b. Planning, is the ability of students to develop a plan or achieve certain goals.

c. Producing is the ability of students to create a product through a production process, where in the production process students can produce works that match the description given.

Practically some factors can affect the process of implementing HOTS-based learning for students, which include internal factors and external factors. Internal factors include student motivation and interest in participating in learning. Meanwhile, external factors can be in the form of the approach and application of the learning system and the suitability of practice questions and exam questions for students' abilities (Tambunan, 2019).

The Significance of High Order Thinking Skills (HOTS) for Elementary Students

The learning process must prioritize the development of higher-order thinking skills because most students prove unable to make connections between what they learn in class or at school and how it applies to their lives outside of school (Kenedi et al., 2019). Learning in elementary schools used to place too much emphasis on rote memory, rather than developing students' capacity for deep reflection and analysis. In other words, the learning process does not seem the same or different from real life, so learning becomes worthless because they cannot apply what they have learned when presented with various scenarios they experience inside or outside the classroom. The thinking ability is considered to be at the Lower Order Thinking Skills (LOTS) level. The LOTS learning pattern requires students to only answer factual questions where there is only one alternative answer, and usually, the answer is in the form of something that can be found directly in a book or by rote learning (Jaenudin et al., 2020). In subsequent developments, the dominant LOTS learning techniques and patterns will place students as passive

learning objects. It would happen because students would not participate actively in their education. Students are ideally positioned as active learning subjects rather than passive learning objects because this is the optimal posture. Students need to have the opportunity to construct new information and understanding from real-world experiences during the learning process; otherwise, they will only be able to repeat existing knowledge. Students are encouraged to take advantage of the various learning tools available to them, especially those that emphasize experiential learning and comprehensive understanding. Students will demonstrate higher levels of what is known as High Order Thinking Skills (HOTS).

According to Newman and Wehlage, students who have high-order thinking skills will be able to distinguish ideas clearly, argue well, be able to solve problems, be able to construct explanations, be able to hypothesize and understand something. In addition, students will find that things complex information becomes clearer Vui (in Azizah et al., 2021) in addition higher-order thinking skills will occur when a person associates new information with information already memorized in his memory and connects it and/or rearranges and develops this information to achieve a goal or finding a solution to a situation that is difficult to solve.

Students must have the capacity to understand HOTS by the time they are in elementary school because it is a very important skill. This is demonstrated by the path taken by education in the 21st century, which not only requires students to understand curriculum subject matter but also encourages them to develop their capacities for critical thinking and analysis (Supena et al., 2021). Students at the elementary school level are considered ready to learn to provide critical statements that might start from learning what is existing around them (Tabroni et al., 2022). The implementation of the 2013 Curriculum (K-13) and the Kurikulum Merdeka for elementary schools which demand the creation of learning that is more in line with the demands of the times, especially partial learning towards integrated learning with the application of the HOTS pattern is one of the efforts being made to improve the HOTS skills of elementary school students. (Usmani, 2017)

Problems of High Order Thinking Skills (HOTS) in Elementary Schools

The fact that high-order thinking skills (HOTS) are still low can be seen from related research. One of them is the research conducted by Hadi et al. (2018) who evaluated the ability of elementary school students to answer HOTS-based arithmetic questions based on Newman's theory. In Hadi's (2021) study it was found that elementary school children's HOTS abilities were still relatively poor. This can be seen from the challenges faced by students at SDN Gerih 1 Ngawi when trying to work on the high-level questions given. Errors in reading questions, errors in understanding the material, errors in transformation, errors in processing ability, and errors in the work process can all contribute to the difficulties experienced by students at SDN Gerih 1 Ngawi.

The quality of instructors who teach students is another factor that plays a very important role in the process of improving students' capacity to use HOTS. In improving children's talents in HOTS, one very significant factor is the quality of the teaching staff they have in elementary schools (Leasa et al., 2021). An instructor needs to have a solid understanding of cognitive processes in both Low-Level Thinking Skills (LOTS) and Higher-Order Thinking Skills (HOTS). This is because an instructor plays a role in optimizing the assessment of Higher Order Thinking Skills both in daily tests and final semester tests, as well as in school exams. According to research results found by Schulz & FitzPatrick (2016), instructors show a lack of understanding of HOTS ideas, and they are not ready to instruct or evaluate questions based on HOTS (Trejo & Galindo, 2022). This conclusion is corroborated by the findings of research conducted by Retnawati (2018) which shows that instructors' knowledge and understanding of HOTS are still low, their capacity in developing student HOTS, and student's ability to solve HOTS-based problems, as well as student assessment activities. Similar findings were obtained by Driana and Ernawati (2019), who came to the same conclusion, that elementary school instructors who provided learning materials to elementary students did not have a good understanding of HOTS. As a result, there were disturbances in higher-order thinking training activities and assessment of elementary students.

According to research conducted by Putri & Sofyan (2019), additional challenges faced by instructors in the process of implementing HOTS-based learning for students include limited teaching time, as well as a lack of understanding of HOTS-based learning, which is still in its early stages as a pedagogical approach. Students participating in HOTS-based learning face some challenges, the most common of which are a lack of understanding of HOTS-based questions and the absence of resources in the form of books and other learning materials. Student progress will be slower through the HOTS-based learning process as a result of this lack of facilities and understanding.

Technology-Based Learning in Improving HOTS Ability in Elementary School Students

Due to rapid technological advances, access to information is now increasing. Students can access this material whenever and wherever they want (Dakhi et al., 2020). This assists the learning process to improve children's abilities in HOTS. Students in elementary schools can increase HOTS by using various learning materials, such as educational films, e-books, websites, and other learning media (Musyaffa & Asiah, 2022). Due to a pleasant learning environment created by using a more interesting learning model, it is expected that students' attention and activity in learning will be attracted to this learning media (Puspitarini & Hanif, 2019). Advances in technology have made it possible to learn outside of traditional classroom settings in our time. Any setting can serve as an educational environment. Even the educational process can be carried out remotely.

Learning video media is often used as a form of technology-supported learning media. The use of instructional videos is becoming more common in the classroom. When presenting educational materials to children in elementary schools, most of the time, instructors will show students various instructional films (Hapsari et al., 2019). However, not all videos have the potential to cause a HOTS increase. Videos that are considered to be able to increase HOTS are videos that focus on problems or cases because students will be motivated to think higher by watching the video than just remembering information. These films can have an impact on student HOTS because they inspire student interest in other learning resources, which in turn can influence student HOTS (Rahayu et al., 2021). This is supported by findings from research conducted by Ichsan et al. (2020)

An application-based e-evaluation that includes practice questions is another example of technology-based learning media that can be used in the learning process. The application-based e-evaluation method is considered more capable of teaching students critical thinking and analytical skills, as well as improving student learning outcomes. Errors introduced by individuals conducting evaluations are often caused by subjectivity, as well as mathematical errors made when summing up assessment findings (Sabon et al., 2022). This can be overcome by electronic evaluation, also known as E-Evaluation, which is combined with a program capable of automatically analyzing and calculating student learning outcomes scores. This can be seen from the research conducted by Yasa et al. (2020) which shows that the application of application-based E-Evaluation such as the Hot Potatoes application is considered feasible, practical, and effective for use as an evaluation of learning in learning in Malang City. Specifically, research shows that the application of application-based E-Evaluation is considered feasible, practical, and effective as an evaluation of learning in learning. Application-based e-evaluation is seen as having some benefits, one of which is the ability to assist educators in assessing the teaching process concerning student characteristics, student environment, and student intelligence growth. This is corroborated by research conducted by Adeyanju, which revealed that student performance is better when using a computer-based assessment system than when using a paper-based evaluation system. Research conducted by Aini & Sulistyani (2019) shows that a HOTS-based E-Quiz is an acceptable instrument for use as a learning evaluation tool because it is theoretically valid and very practical for instructors to use as an instrument for assessing student knowledge and skills.

CONCLUSION

The development of an increasingly sophisticated era has had a huge impact on human existence in general, including the field of education in particular. Learning media that can be

accessed is also increasingly diverse along with the increasingly sophisticated technology available. Students should benefit from this in the learning process, both inside and outside the classroom. Students are now required to not only understand learning material but also think critically and be able to apply learning material in the form of theory in daily life. This is due to the development of the times in the 21st century which is also followed by the demands of students' abilities in the world of educational standards. The process of thinking at a higher level than just remembering information or articulating what has been learned to others is called higher-order thinking skills. These skills can be developed through various activities. Someone must be able to understand, draw conclusions, connect facts with ideas, classify, manipulate, seek information in an event that occurs, and find a solution to a problem that arises to solve HOTS. Students need to start developing their talents in HOTS from an early age because they are very vital abilities. The utilization of technology-based learning media is a method that is considered effective and more practical in improving HOTS abilities in elementary school students. This can be achieved through the use of various learning media, including learning videos, digital learning media, e-evaluation, and other learning media.

REFERENCES

Aini, D. F. N., & Sulistyani, N. (2019). Pengembangan Instrumen Penilaian E-Quiz (Electronic Quiz) Matematika Berbasis HOTS (Higher of Order Thinking Skills) untuk Kelas V Sekolah Dasar. Edumaspul: Jurnal Pendidikan, 3(2), 1–10. https://doi.org/10.33487/edumaspul.v3i2.137

Azizah, R., Awi, A., Asyari, S., & Siman, R. (2021). Mathematics Problem-Solving Ability Based on Learning Style of Junior High School. International Conference on Educational Studies in Mathematics (ICoESM 2021), 611(ICoESM), 27–33.

Chrisyarani, D. D., & Setiawan, D. A. (2021). 4C-Based Cooperative Learning Model Through Lesson Study Activities on Indonesian Course for Elemantary School. Proceedings of the 2nd Annual Conference on Social Science and Humanities (ANCOSH 2020), 542, 338–343. https://doi.org/10.2991/assehr.k.210413.078

Dakhi, O., Jama, J., & Irfan, D. (2020). Blended Learning: a 21St Century Learning Model At College. International Journal of Multi Science, 1(7), 50–65.

Erita, Y., Jannah, R., Fitria, Y., & Eliyasni, R. (2020). Students' progress in integrated thematic learning with scientific approaches. International Journal of Innovation, Creativity and Change, 13(6), 36–48.

Fajriyah, K., & Agustini, F. (2018). Analisis Keterampilan Berpikir Tingkat Tinggi Siswa SD Pilot Project Kurikulum 2013 Kota Semarang. Elementary School, 5(1), 1–6.

Febriyanto, E., Naufal, R. S., & Budiarty, F. (2019). Attitude Competency Assessment in the 2013 curriculum based on elementary school Prototyping methods. IAIC Transactions on Sustainable Digital Innovation (ITSDI), 1(1), 87–96. https://doi.org/10.34306/itsdi.v1i1.6

Ghanizadeh, A., Al-Hoorie, A. H., & Jahedizadeh, S. (2020). Higher order thinking skills in the language classroom: A concise guide. In M. Pawlak (Ed.), Second Language Learning and Teaching (1st ed.). Springer International Publishing.

Hadi, S., Retnawati, H., Munadi, S., Apino, E., & Wulandari, N. F. (2018). The Difficulties Of High School Students In Solving HOTS Problems. Problems of Education in the 21st Century, 76(4), 97–106.

Hapsari, A. S., Hanif, M., Gunarhadi, & Roemintoyo. (2019). Motion graphic animation videos to improve the learning outcomes of elementary school students. European Journal of Educational Research, 8(4), 1245–1255. https://doi.org/10.12973/eu-jer.8.4.1245

Hidayah, I., Isnarto, Masrukan, Asikin, M., & Margunani. (2021). Quality Management of Mathematics Manipulative Products to Support Students ' Higher Order Thinking Skills. Intenational Journal of Instruction, 14(1), 537–554.

Ichsan, I. Z., Sigit, D. V., Rahmayanti, H., Purwanto, A., Rosyid, A., Suwandi, T., Ali, A., & Hermawati, F. M. (2020). Implementasi model pembelajaran ILMIZI dan peningkatan HOTS siswa SD

berdasarkan gender pada pembelajaran lingkungan. JIPVA (Jurnal Pendidikan IPA Veteran), 4(1), 11–24. https://doi.org/https://doi.org/10.31331/jipva.v4i1.1076 How

Jaenudin, R., Chotimah, U., Farida, F., & Syarifuddin, S. (2020). Student Development Zone: Higher Order Thinking Skills (Hots) in Critical Thinking Orientation. International Journal of Multicultural and Multireligious Understanding, 7(9), 11. https://doi.org/10.18415/ijmmu.v7i9.1884

Kenedi, A. K., Helsa, Y., Ariani, Y., Zainil, M., & Hendri, S. (2019). Mathematical connection of elementary school students to solve mathematical problems. Journal on Mathematics Education, 10(1), 69–79. https://doi.org/10.22342/jme.10.1.5416.69-80

Khairani, S., Suyanti, R. D., & Saragi, D. (2020). The Influence of Problem Based Learning (PBL) Model Collaborative and Learning Motivation Based on Students' Critical Thinking Ability Science Subjects in Class V State Elementary School 105390 Island Image. Budapest International Research and Critics in Linguistics and Education (BirLE) Journal, 3(3), 1581–1590. https://doi.org/10.33258/birle.v3i3.1247

Kurniawan, T. T., Santoso, & Utaminingsih, S. (2020). Analysis of 4C-Based HOTS Assessment Module on Critical Thinking Ability Analysis of 4C-Based HOTS Assessment Module on Critical Thinking Ability. Journal of Physics : Conference Series, 1823. https://doi.org/10.1088/1742-6596/1823/1/012101

Leasa, M., Batlolona, J. R., & Talakua, M. (2021). Elementary students' creative thinking skills in science in the Maluku islands, Indonesia. Creativity Studies, 14(1), 74–89. https://doi.org/10.3846/cs.2021.11244

Maslihah, S., Waluya, S. B., Rochmad, & Suyitno, A. (2020). The Role of Mathematical Literacy to Improve High Order Thinking Skills. Journal of Physics: Conference Series, 1539(1). https://doi.org/10.1088/1742-6596/1539/1/012085

Musyaffa, A. A., & Asiah, S. (2022). Increasing Higher Order Thinking Skills of Elementary School Students through Video in Environmental Pollution Case. Jurnal Basicedu, 6(3), 4259–4264. https://doi.org/https://doi.org/10.31004/basicedu.v6i3.2701 INTRODUCTION

Pradani, N., Suharti, S., & Widarti, H. R. (2021). Development and Validation of Higher Order Thinking Skills Based Instrument on Reaction Rate Subject. JPP (Jurnal Pendidikan Dan Pembelajaran), 28(2), 52–58. https://doi.org/10.17977/um047v28i22021p052

Pulungan, M., Toybah, & Vina Amilia Suganda, M. (2021). Need Analysis of Instruments Assessment of Curriculum 2013 Based on Higher Order Thinking Skills (HOTS) for Elementary School Students. 4th Sriwijaya University Learning and Education International Conference (SULE-IC 2020), 513, 269–274. https://doi.org/10.2991/assehr.k.201230.117

Puspitarini, Y. D., & Hanif, M. (2019). Using Learning Media to Increase Learning Motivation in Elementary School. Anatolian Journal of Education, 4(2), 53–60. https://doi.org/https://doi.org/10.29333/aje.2019.426a

Putri, B. A., & Sofyan, F. A. (2019). Analisis Kesulitan Proses Pembelajaran Berbasis Hots Di Kelas V Sdn 4 Muara Padang. El-Ibtidaiy:Journal of Primary Education, 2(2), 59–73. https://doi.org/10.24014/ejpe.v2i2.7961

Rachmadtullah, R., Yustitia, V., Setiawan, B., Fanny, A. M., Pramulia, P., Susiloningsih, W., Rosidah, C. T., Prastyo, D., & Ardhian, T. (2020). The challenge of elementary school teachers to encounter superior generation in the 4.0 industrial revolution: Study literature. International Journal of Scientific and Technology Research, 9(4), 1879–1882.

Rahayu, S., Ladamay, I., Wiyono, B. B., Susanti, R. H., & Purwito, N. R. (2021). Electronics Student Worksheet Based on Higher Order Thinking Skills for Grade IV Elementary School. International Journal of Elementary Education, 5(2), 453–460. https://doi.org/10.23887/ijee.v5i3.36518

Sabon, Y. O. S., Istiyono, E., & Salamah, U. (2022). Technology Literacy in the Development of Mathematics Learning in Indonesia During the Covid-19 Pandemic. Proceedings of the 5th International Conference on Current Issues in Education (ICCIE 2021), 640(Iccie 2021), 137–142. https://doi.org/10.2991/assehr.k.220129.025

Saraswati, P. M. S., & Agustika, G. N. S. (2020). Kemampuan Berpikir Tingkat Tinggi Dalam Menyelesaikan Soal HOTS Mata Pelajaran Matematika. Jurnal Ilmiah Sekolah Dasar, 4(2), 257–269. https://doi.org/10.23887/jisd.v4i2.25336

Sole, F. B., & Anggraeni, D. M. (2020). Analysis of High Order Thinking Skill (HOTS) in joint midterm examination at YAPNUSDA Elementary School. Journal of Physics: Conference Series, 1440(1). https://doi.org/10.1088/1742-6596/1440/1/012102

Supena, I., Darmuki, A., & Hariyadi, A. (2021). The influence of 4C (constructive, critical, creativity, collaborative) learning model on students' learning outcomes. International Journal of Instruction, 14(3), 873–892. https://doi.org/10.29333/iji.2021.14351a

Tabroni, I., Irpani, A., Ahmadiah, D., Agusta, A. R., Givirya, S., & Ichsan. (2022). Implementation and Strengthening of the Literacy Movement in Elementary Schools Pasca the Covid-19 Pandemic. Multicultural Education, 8(01 SE-Articles), 15–31.

Tambunan, H. (2019). The Effectiveness of the Problem Solving Strategy and the Scientific Approach to Students' Mathematical Capabilities in High Order Thinking Skills. International Electronic Journal of Mathematics Education, 14(2), 293–302. https://doi.org/10.29333/iejme/5715

Trejo, O. M. N., & Galindo, C. R. (2022). English Teachers' Perceptions of Higher Order Thinking Skills. CIEX Journ@l, 14.

Usmaedi. (2017). Menggagas Pembelajaran HOTS Pada Anak Usia Sekolah Dasar. Jurnal Pendidikan Sekolah Dasar, 3(1), 82. https://doi.org/10.30870/jpsd.v3i1.1040

Widiawati, L., Joyoatmojo, S., & Sudiyanto. (2018). Higher order thinking skills as effect of problem based learning in the 21st century learning. International Journal of Multicultural and Multireligious Understanding, 5(3), 96–105. http://ijmmu.com

Yasa, A. D., Suastika, K., & Zubaidah, R. S. A. N. (2020). Pengembangan E-Evaluation Berbasis Aplikasi Hot Potatoes Untuk Siswa Kelas V Sekolah Dasar. Jurnal Ilmiah Sekolah Dasar, 4(1), 26. https://doi.org/10.23887/jisd.v4i1.23987