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Implementation of Science Learning Based on Higher Order Thinking Skills (HOTS) in Elementary Schools

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Abstrak: Penelitian ini bertujuan untuk mendeskripsikan implementasi pembelajaran Ilmu Pengetahuan Alam (IPA) berbasis *Higher Order Thinking Skills* (HOTS) di kelas I dan IV SDIT Al Insan Islamic School Kota Bekasi. Dengan menggunakan pendekatan deskriptif kualitatif, data dikumpulkan melalui observasi, wawancara, dan dokumentasi. Hasil penelitian menunjukkan bahwa guru telah merancang dan melaksanakan rencana pelajaran yang berorientasi HOTS, meskipun menghadapi kendala seperti keterbatasan sumber daya dan tingkat pemahaman siswa yang bervariasi. Solusi yang diterapkan mencakup pelatihan guru dan pendekatan pembelajaran kontekstual. Studi ini menyimpulkan bahwa pembelajaran berbasis HOTS meningkatkan keterampilan berpikir kritis dan analitis siswa, meskipun terdapat beberapa tantangan dalam implementasinya.

Kata Kunci: HOTS, pembelajaran IPA, sekolah dasar, berpikir kritis, analisis deskriptif

Abstract: This study aims to describe the implementation of Science learning based on Higher Order Thinking Skills (HOTS) in grades I and IV at SDIT Al Insan Islamic School, Bekasi City. Using a qualitative descriptive approach, data were collected through observation, interviews, and documentation. The results show that teachers have designed and implemented HOTS-oriented lesson plans, despite facing constraints such as limited resources and varying levels of student understanding. The solutions applied include teacher training and contextual learning approaches. This study concludes that HOTS-based learning enhances students' critical and analytical thinking skills, although several challenges remain in its implementation.

Keywords: HOTS, science learning, elementary school, critical thinking, descriptive analysis

INTRODUCTION

21st-century education presents unique and complex challenges, demanding the development of higher-order thinking skills in students (Mokoginta et al., 2025). In this context, Higher Order Thinking Skills (HOTS) become crucial. HOTS encompasses abilities that go beyond merely remembering or understanding information; it includes the capacity to analyze, evaluate, and create, as outlined in the revised Bloom's Taxonomy by Anderson and Krathwohl in 2001 (Hidayat et al., 2025).

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In Indonesia, integrating HOTS into the educational curriculum, particularly in Science subjects, is not just important but an urgent necessity (Fauzan et al., 2023). In an era of globalization marked by increasingly complex and evolving challenges—such as climate change affecting ecosystems and human life, technological advancements altering how we interact and work, and social issues requiring innovative approaches—it is essential for students to develop adequate skills (Rahayu et al., 2023).

By integrating HOTS into the teaching and learning process, students are not only provided with factual knowledge about scientific concepts but are also trained to develop critical and creative thinking abilities. They are taught not to passively receive information but to interact with, evaluate, and interpret data from various sources. This approach encourages students to question, doubt, and seek evidence supporting their arguments (Hidayati & Saparudin, 2023).

Science learning in Elementary Schools should encourage students not only to memorize facts but also to develop critical, creative, and analytical thinking skills. The Ministry of Education and Culture (2018) emphasizes the importance of HOTS-oriented learning to foster students' problem-solving abilities and prepare them for the needs of future society (Dilah, 2023). Furthermore, Islamic educational values, as reflected in Surah Ali 'Imran (3): 190-191, advocate for the cultivation of intellectual and spiritual intelligence through contemplation of natural phenomena (Triana & Ulfah, 2024).

Moreover, through the application of HOTS, students are expected to be able to create innovative solutions to various problems around them. For instance, in the context of climate change, they can engage in projects focused on reducing carbon emissions, managing natural resources sustainably, or developing environmentally friendly technologies (Purwanto, 2024). Thus, HOTS-based education not only prepares students for academic examinations but also equips them with essential life skills to contribute positively to society.

Therefore, it is crucial for educators and policymakers to actively develop and implement strategies that support the integration of HOTS in Science courses. This includes training for teachers, developing relevant learning materials, and creating a learning environment that supports exploration and collaboration (Aripin et al., 2020). Through these efforts, it is hoped that Indonesian students will become a generation that is not only knowledgeable but also capable of thinking critically and creatively in facing increasingly complex and dynamically changing global challenges.

Preliminary observations conducted at SDIT Al Insan Islamic School Bekasi revealed that the implementation of Science learning based on Higher Order Thinking Skills (HOTS) began concurrently with the implementation of the Merdeka Curriculum in the 2023/2024 academic year. Although teachers in grades I and IV have taken steps to apply this approach focused on developing higher-order thinking skills, a number of significant challenges have been identified.

One of the main obstacles is the limitation of available teaching resources, which includes learning materials and the necessary aids to support an interactive and in-depth learning process. Furthermore, the training provided to teachers regarding the mastery of HOTS methods is still considered inadequate, thus hindering their ability to implement this approach effectively in the classroom.

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Moreover, students' readiness to adapt to a learning approach that demands critical and analytical thinking varies, creating an additional challenge in ensuring that all students can follow and benefit from the new learning method. This indicates the need for a more comprehensive strategy to support both teachers and students in overcoming these obstacles, so that the implementation of HOTS-based Science learning can run more smoothly and effectively.

In an effort to address the emerging challenges in learning, this research proposes a number of comprehensive solutions designed to enhance the quality of teaching and learning. Some of the proposed solutions include regular teacher training, aimed at updating educators' knowledge and skills in applying the HOTS approach. This training focuses not only on theory but also on best practices applicable in the classroom.

Additionally, this research emphasizes the importance of developing HOTS-based teaching modules. These modules are designed to encourage students to think critically and creatively and to solve complex problems. With structured and relevant teaching modules, the teaching and learning process is expected to become more engaging and effective.

The use of various assessment methods is also a primary focus of this research. Diverse assessment methods, such as formative, summative, and authentic assessments, will not only provide a more holistic picture of student abilities but can also help teachers identify areas needing improvement in the learning process.

Overall, this research aims to provide an in-depth description of the planning, implementation, constraints faced, and applicable solutions in the context of HOTS-based Science learning in the studied classes. Thus, it is hoped that this research can make a significant contribution to the development of more effective and innovative teaching methods.

METHODS

This research used a qualitative descriptive approach to explore the implementation of HOTS-based Science learning in grades I and IV of SDIT Al Insan Islamic School Bekasi. The research subjects included the school principal, the curriculum vice-principal, and the grade I and IV Science teachers.

Data were collected through: 1) Non-participant observation to document classroom activities and student interactions. 2) Semi-structured interviews using guidelines developed based on the seven research sub-foci. 3) Documentation of Lesson Plans (RPP), student work results, and school policy documents.

Data analysis followed the Miles and Huberman model, which includes data reduction, data display, and conclusion drawing (Alt-Hessenbruch, 2022). Source and method triangulation were applied to ensure data validity (Husnullail et al., 2024).

RESULTS AND DISCUSSION

Teacher Planning in HOTS-Based Science Learning

At SDIT Al Insan, teachers have taken innovative steps by developing Lesson Plans that specifically integrate HOTS-oriented learning objectives. In this context, one prominent example is in grade IV, where the teacher designed a project that required students not only to understand but also to analyze relevant environmental issues. This

task asked students not just to identify problems but also encouraged them to think critically and creatively in proposing practical and sustainable solutions.

Although there are a number of challenges in applying HOTS principles among educators, many teachers have actually demonstrated a remarkable ability to effectively translate and implement this approach. The various carefully designed learning plans have successfully integrated higher-order thinking skills, which encourage students not only to think critically but also to innovate and create solutions in various situations (Fai et al., 2025). As a result, these students have demonstrated impressive analytical abilities in diverse contexts, both in academic situations and daily life. Thus, although challenges remain, there are many successful examples proving that the application of HOTS can have a significant positive impact on the learning process and the development of student competencies.

Furthermore, the training and support provided to educators often does not yield effective solutions, given that each teacher has a unique teaching style and educational context. In practice, an approach that overemphasizes HOTS risks neglecting the importance of a strong mastery of basics. Without a solid foundation in basic knowledge, students' ability to think critically and creatively will not develop optimally (Nurishlah et al., 2023).

Therefore, it is crucial to find the right balance between HOTS and Lower Order Thinking Skills (LOTS). By integrating both approaches, students will not only be prepared to face complex and diverse challenges but will also have a deep and solid understanding of the material they learn. This will not only enrich their learning experience but also enhance their ability to apply knowledge in real situations. This balanced approach will ensure that students not only become critical thinkers capable of analyzing and evaluating information but also have a strong foundation to support that thinking process (Ramadhani et al., 2024).

Implementation of HOTS-Based Learning

In effective educational practice, teachers implement various innovative strategies specifically designed to stimulate and develop students' critical thinking skills. Some commonly used approaches include problem-based learning, dynamic group discussions, and engaging interactive science projects.

For example, first-grade students were given the opportunity to conduct an in-depth comparison of the characteristics of plants and animals. This activity involved not only deep visual observation but also systematic data collection and constructive discussion about the role of each organism in the broader ecosystem. Through this approach, students not only learned to recognize physical characteristics but also understood the complex interactions occurring in nature, enriching their understanding of their environment.

On the other hand, fourth-grade students were engaged in simple experiments focusing on the issue of water pollution. In this activity, they not only learned about the impact of pollution on the environment but also delved deeper into the importance of maintaining water quality as a vital resource for life. Through direct observation and the experiments they conducted, students could see firsthand how pollutants affect aquatic ecosystems. This activity encouraged them to think critically about actions that can be

taken to protect the environment and raised awareness of personal and collective responsibility in maintaining the sustainability of natural resources.

These activities not only served to encourage students to analyze and evaluate the information they obtained but also played an important role in inspiring them to develop new ideas and innovative solutions in facing various real challenges around them. Through this approach, students do not merely become passive recipients of information; they transform into active actors in the learning process. This not only sparks deep curiosity but also stimulates their creativity to think outside conventional boundaries (Nabila et al., 2024). Thus, students are invited to collaborate, innovate, and apply the knowledge they possess in a broader context, thereby preparing them to become resilient and creative problem solvers in the future.

Constraints Faced by Teachers

Some of the identified obstacles in the implementation of HOTS-based learning are as follows:

1. Limited Resources:
   One of the main challenges is the lack of availability of teaching materials specifically designed to support the development of HOTS. Many educational institutions do not yet have adequate access to resources, such as learning modules, textbooks, and visual aids that can facilitate HOTS-based learning. Furthermore, the laboratory equipment necessary for practical experiments is also often inadequate, hindering students from applying theoretical concepts into practice (Utaminingsih & Rahayu, 2021).
2. Student Readiness:
   Not all students have the same readiness in facing HOTS-oriented tasks. Many of them are not yet accustomed to the type of tasks that require in-depth analysis, complex problem-solving, and high creativity. This could be due to previous learning methods that emphasized memorization and basic understanding, making it difficult for students to adapt to an approach that demands active engagement and critical thinking (Suharno et al., 2022).
3. Time Constraints:
   Designing and effectively implementing activities focused on HOTS requires more time compared to traditional teaching methods. Teachers need to spend time designing activities that are not only engaging but also challenge students to think critically and creatively. Additionally, the time required to delve deeper into the material and provide constructive feedback to students is also a factor that cannot be ignored. This often becomes an additional burden for educators who already have a packed schedule (Nirtha et al., 2024).

By understanding these obstacles, it is hoped that appropriate solutions can be found to improve the quality of learning and support the development of HOTS among students.

Solutions to Overcome Constraints

Teachers and the school have implemented various innovative solutions to enhance the quality of learning, including:

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1. In-House Training:
   Conducting workshops focused on developing teaching strategies based on HOTS. In this training, educators are taught methods and techniques that can stimulate students' critical and analytical thinking, enabling them to tackle complex problems and think creatively (Muhibbuddin et al., 2023).
2. Contextual Learning:
   The school utilizes real-world problems as a tool to make HOTS concepts more understandable and relevant to students. By connecting subject matter with situations they encounter in daily life, students can directly see the practical application of the knowledge they have learned, which in turn increases their motivation and engagement in the learning process (Yolanda, 2024).
3. Differentiated Learning:
   The school is committed to adapting learning tasks and activities to the varying ability levels of students. With this approach, every student is given the opportunity to learn according to their own pace and learning style. This not only helps students who may be struggling but also challenges faster learners to remain engaged and develop optimally (Fauzan et al., 2023).

Through the implementation of these solutions, it is expected that students will acquire not only knowledge but also the critical thinking skills necessary to face future challenges.

Evaluation of HOTS Learning Implementation

Teachers apply various assessment methods to evaluate student development holistically. Among these methods, portfolios are an effective tool, as they allow students to collect and present their best work, reflecting their learning process and achievements over time. Furthermore, project evaluation provides students with the opportunity to apply their knowledge and skills in real-world contexts, honing their collaboration and problem-solving abilities (Magdalena et al., 2023).

Although teachers apply various assessment methods to evaluate student progress, there is an argument that the use of portfolios and project evaluation is not always effective. Portfolios, while capable of showcasing students' best work, may not reflect their overall abilities, as students can select only their best results and overlook areas needing improvement (White, 2004). Project evaluation can sometimes be unfair, especially if students do not have equal access to the resources or support needed to complete the project. This can lead to inequalities in assessment and overlook an individual's true capabilities. Additionally, these methods can consume valuable time that should be used for direct instruction, diverting focus from the core learning required by the curriculum (Haris et al., 2025).

On the other hand, many argue that the use of portfolios and project evaluation is actually very effective in assessing student progress. Portfolios allow students to demonstrate their progress over time and provide a more comprehensive picture of their skills and understanding. By selecting their best work, students also learn to reflect on their learning process and identify their strengths and weaknesses (Hodgman, 2014). Furthermore, project evaluation can encourage collaboration and creativity, which are essential skills in the real world. Although there are challenges related to resource

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access, this approach can be adapted by providing additional support for students in need, thereby creating fairer learning opportunities. Finally, although it may be time-consuming, using these methods can increase student engagement and facilitate deeper learning, ultimately enriching their educational experience (Evenddy et al., 2023).

Another evaluation method that can be used is structured observation. This method is very important in the educational context, where teachers have the opportunity to conduct in-depth observations of student interactions in various learning situations. Through this approach, teachers can not only assess the final outcome of learning but also observe and analyze the process of students' critical and creative thinking when they are faced with various challenges (Aprilya et al., 2023).

This observation process allows teachers to capture the nuances of classroom dynamics, including how students collaborate, communicate, and solve problems. By understanding these interactions, teachers can identify the strengths and weaknesses of individual students, as well as behavioral patterns that may affect their learning (Purwanto et al., 2022).

Furthermore, the combination of various assessment tools used in this structured observation creates a more comprehensive picture of student progress. This not only helps teachers provide more constructive and specific feedback but also plays an important role in designing more effective learning experiences tailored to the needs of each student. Thus, structured observation becomes an essential tool for improving the quality of education and supporting the holistic development of students (Nopitasari, 2021).

Advantages of HOTS-Based Science Learning

The application of HOTS has proven to have a significant impact on improving students' analytical skills, motivation, and engagement in the learning process. This method not only encourages students to merely remember and memorize information but also invites them to actively participate in the learning process in a more creative and critical way.

With the HOTS approach, students are encouraged to experiment, evaluate various information, and create new knowledge based on a deep understanding. They learn to think critically and analytically, enabling them to connect the concepts they have learned with real-life situations. This not only enhances their academic abilities but also builds self-confidence and intrinsic motivation to continue learning (Purwanto, 2024).

Furthermore, the application of these higher-order thinking skills creates an interactive and collaborative learning environment where students can discuss, debate, and share their views. This not only enriches individual learning experiences but also strengthens their social and communication skills (Haryono et al., 2025).

Teachers reported a significant improvement in students' ability to solve complex problems, with figures ranging from 10% to 20%. This increase is not just a number but reflects a profound development in students' critical and creative thinking skills. Students are now more capable of facing challenges that require in-depth analysis, innovative problem-solving, and appropriate decision-making in unexpected situations.

Additionally, student motivation and engagement in the learning process also experienced a positive surge. This creates a more dynamic and interactive learning

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atmosphere, where students are not just passive recipients of information but are actively involved in discussions and collaboration with their peers. They feel more enthusiastic and have a greater sense of responsibility for their own learning process, which in turn drives them to invest more in their education.

Thus, the integration of HOTS into the curriculum is not merely following a trend of modern teaching methods but is a crucial strategic step in shaping a younger generation that is more prepared and adaptable in facing various challenges in a constantly changing and evolving world. It is an effort to prepare students not only to function in today's society but also to become leaders and innovators in the future (Wahidin, 2023).

Disadvantages of HOTS-Based Learning

Although the application of Higher Order Thinking Skills (HOTS) in the learning process offers significant benefits, there are a number of substantive challenges that must be faced by learners. One of the most prominent main challenges is the increased workload for teachers. Designing HOTS-based assessments not only takes longer but also requires considerably more effort compared to simpler conventional assessments (Afifah & Retnawati, 2019).

Teachers bear the responsibility of developing questions that not only support students' basic understanding but must also encourage them to think critically, analytically, and creatively. This process is not easy; it requires in-depth research, careful planning, and meticulous testing to ensure that the designed assessments are truly effective and relevant to the intended learning objectives.

Furthermore, teachers must also consider various other aspects, such as the level of difficulty appropriate to students' abilities, the learning context, and ways to provide constructive feedback. All of this points to the need for higher skills and knowledge from a teacher, which can add pressure to their duties (Ahmadi, 2024).

The anxiety experienced by students is also a very significant challenge in the context of modern education. Many students feel overwhelmed when faced with open-ended tasks that require the ability to think independently and construct logical arguments. This is often caused by limitations in their previous learning experiences, where students may not be accustomed to a learning approach that demands deep analysis and creativity.

The pressure to achieve good results can also worsen the situation, creating a stressful atmosphere that can hinder students' ability to function optimally. Uncertainty about their own abilities and fear of judgment from teachers or peers can add to the mental burden they feel.

Therefore, it is very important for educators to provide adequate support to students. This includes training in critical thinking skills that not only teaches them how to construct logical arguments but also encourages them to explore new ideas and question existing assumptions (Purwanto et al., 2022). Additionally, stress management is also a crucial component that needs attention; students must be given tools and strategies to cope with the pressures they face, so they can be more confident and resilient in confronting the challenges presented by this HOTS approach (Urbayatun et al., 2020).

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With the right support, students can not only overcome their anxiety but also develop into critical thinkers capable of contributing positively to their learning environment.

CONCLUSION

This study concludes that Higher Order Thinking Skills (HOTS)-based Science learning at SDIT Al Insan Islamic School has been partially implemented, and the results show a significant positive impact. The teachers at this school demonstrated a strong commitment to designing and implementing various learning activities oriented towards developing higher-order thinking skills. Nevertheless, they also faced various challenges, both structural and pedagogical, which could affect the effectiveness of this method's implementation.

This HOTS learning approach not only succeeded in enhancing students' analytical and synthesis abilities but was also aligned with national education goals that emphasize the importance of character development and critical thinking skills. Furthermore, this approach also reflects the values of Islamic education, which prioritize deep understanding and the capacity for reflective thinking. Thus, this study indicates that, despite several obstacles, the effort to integrate HOTS into science learning at SDIT Al Insan Islamic School has positively contributed to students' academic and character development.

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REFERENCES

Afifah, I. R. N., & Retnawati, H. (2019).*Is it difficult to teach higher order thinking skills*. https://doi.org/10.1088/1742-6596/1320/1/012098

Ahmadi, E. anas. (2024). Urgensi Kompetensi Penilaian dan Pengambilan Keputusan Bagi Guru.*Akuntansi*. https://doi.org/10.55606/akuntansi.v3i1.1482

Alt-Hessenbruch, M. (2022). Data Presentation in Qualitative Research: The Outcomes of the Pattern of Ideas with the Raw Data.*International Journal of Qualitative Research*. https://doi.org/10.47540/ijqr.v1i3.448

Aprilya, A., Setyani, G. R. T., Pitaloka, N. R., & Cahyani, S. P. (2023).*Menganalisis Efektivitas Metode Evaluasi Pembelajaran di Sekolah Dasar Tinjau terhadap Kinerja Siswa dan Peningkatan Prestasi Belajar*.*2*(3), 595–603. https://doi.org/10.58578/aldyas.v2i3.1479

Aripin, F. Y., Cahyana, U., & Suseno, M. (2020). The effect of learning models and learning independence on higher-order thinking skills in ipa learning.*International Journal of Approximate Reasoning*. https://doi.org/10.21474/IJAR01/11016

Dilah, S. (2023). Pembelajaran IPA Berbasis Higher Order Thinking Skills di SD Era Society 5.0.*Review Pendidikan Dasar: Jurnal Kajian Pendidikan Dan Hasil Penelitian*. https://doi.org/10.26740/jrpd.v9n3.p161-166

Evenddy, S. S., Gailea, N., & Syafrizal. (2023).*Exploring the Benefits and Challenges of Project-Based Learning in Higher Education*. https://doi.org/10.59175/pijed.v2i2.148

Fai, M. S., Kasmawati, K., & Ardi, R. (2025).*Penerapan Pembelajaran High Order Thinking Skill (HOTS) Pada Mata Pelajaran IPA Siswa Kelas V SDN 23 Kendari*. https://doi.org/10.64690/jhuse.v1i5.252

Fauzan, F., Ansori, R. A. M., Dannur, Moh., Pratama, A., & Hairit, A. (2023). The Implementation of the Merdeka Curriculum (Independent Curriculum) in Strengthening Students' Character in Indonesia.*Aqlamuna: Journal of Educational Studies*. https://doi.org/https://doi.org/10.58223/aqlamuna.v1i1.237

Haris, A., Hasyim, M., Ma'ruf, M., Halim, A. D., Mahir, M., & Ramadhan, I. (2025). THE EFFECTIVENESS OF DYNAMIC PROBLEM-SOLVING STRATEGY AND INNOVATIVE ASSESSMENT TOOLS TO IMPROVE STUDENTS' HIGHER-ORDER THINKING SKILLS.*Jurnal Pendidikan IPA Indonesia*. https://doi.org/10.15294/jpii.v14i1.21433

Haryono, H., Ginanjar, F. A., & Rosyalita, D. (2025). The Effectiveness of Collaborative Learning Strategies in Enhancing Critical Thinking Skills Among General Education Students.*The Journal of Academic Science*.https://doi.org/10.59613/tsc9kg32

Hidayat, M. A., Agustin, D. T., Hana, N., Ramadhani, R., Pratiwi, D. A., & Aslamiah, A. (2025). Keunggulan Implementasi Kurikulum Merdeka Berbasis Pendekatan Deep Learning di SDN 1 Sungai Besar.*Pendas: Jurnal Ilmiah Pendidikan Dasar*.

Hidayati, B. T., & Saparudin, S. (2023). Higher Order Thingking Skills (Hots) dalam Konsep Integrasi Pendidikan Islam dan Sains.*EduInovasi*. https://doi.org/10.47467/edui.v4i1.5800

Hodgman, M. R. (2014). Using Authentic Assessments to Better Facilitate Teaching and Learning: The Case for Student Portfolios.*Journal of Studies in Education*. https://doi.org/10.5296/JSE.V4I3.6149

Husnullail, M., Risnita, Jailani, M. S., & Asbui. (2024). TEKNIK PEMERIKSAAN KEABSAHAN DATA DALAM RISET ILMIAH.*JURNAL GENTA MULIA*.

Magdalena, I., Aciakatura, C., & Putri, W. A. (2023). Efektivitas Pembelajaran Menggunakan Penilaian Portofolio.*Tsaqofah*. https://doi.org/10.58578/tsaqofah.v3i5.1383

Mokoginta, D., Pomalingo, S., & Ismail, R. P. (2025). LINGKUNGAN BELAJAR ABAD 21 PADA PEMBELAJARAN PENDIDIKAN KEWARGANEGARAAN (PKN) DI SEKOLAH DASAR NEGERI (SDN) 3 TAPA, KABUPATEN BONE BOLANGO.*Jurnal Riset Ilmiah*. https://doi.org/https://doi.org/10.62335

Muhibbuddin, M., Artika, W., & Nurmaliah, C. (2023). Improving Critical Thinking Skills Through Higher Order Thinking Skills (HOTS)-Based Science.*International Journal of Instruction*. https://doi.org/10.29333/iji.2023.16417a

Nabila, N. P., Rahayu, F., & Rahmawati Elfina, E. M. (2024). Encourage students to think critical and innovative with the problem based learning model.*Journal of Historical Education Studies*. https://doi.org/10.61677/satmata.v2i1.176

Nirtha, E., Hanip, R., & Tembang, Y. (2024). Strategi Guru (SAGU) dalam implementasi HOTS pada Pembelajaran di SD INPRES Polder Merauke: Sebuah Analisis.*Kelola: Jurnal Manajemen Pendidikan*. https://doi.org/10.24246/j.jk.2024.v11.i1.p71-81

Nopitasari, N. (2021).*Analysis of the Application of Observation in Thematic Learning in Class IV Elementary School*. https://doi.org/10.22437/teknopedagogi.v11i1.32708

Nurishlah, L., Hasanah, I. U., & Samadi, M. (2023).*Strategi Pengembangan High Order Thinking Skill Pada Siswa Sekolah Dasar*. https://doi.org/10.69768/jt.v1i1.31

Purwanto, A. (2024).*Higher Order Thinking Skills: Concept and Implementation in Learning*. https://doi.org/10.69768/jt.v2i1.44

Purwanto, A., Rahmawati, Y., Rahmayanti, N., Mardiah, A., & Amalia, R. (2022). SOCIO-CRITICAL AND PROBLEM-ORIENTED APPROACH IN ENVIRONMENTAL ISSUES FOR STUDENTS' CRITICAL THINKING SKILLS DEVELOPMENT IN CHEMISTRY LEARNING.*Journal of Technology and Science Education*. https://doi.org/10.3926/jotse.1341

Rahayu, S., Yudi, Y., Rahayu, R., & Luthfi, M. (2023). The relationship of balanced scorecard perspectives and government organization performance measurement.*International Journal of Productivity and Performance Management*. https://doi.org/10.1108/IJPPM-05-2021-0308

Ramadhani, F., Nurfadilah, Khotimah, St. K., & Taqwa, R. A. (2024).*Implementasi Lots Dan Hots Serta Implikasi Pada Proses Pembelajaran Di Sekolah Dasar*. https://doi.org/10.70292/jpcp.v2i2.113

Suharno, S., Akhyar, M., Pambudi, N. A., Roemintoyo, R., Sukatiman, S., Habsya, C., & Cahyono, B. (2022). Menguji Kesiapan Belajar Siswa Berbasis High Order Thinking Skill di Indonesia.*Jiptek: Jurnal Ilmiah Pendidikan Teknik Dan Kejuruan*. https://doi.org/10.20961/jiptek.v15i1.65187

Triana, A., & Ulfah, M. (2024). Nilai – Nilai Pendidikan Agama Dalam Menjaga Kelestarian Lingkungan Melalui Kajian QS. Ali Imron Ayat 190 - 191.*Kutubkhanah*. https://doi.org/10.24014/kutubkhanah.v24i1.30193

Urbayatun, S., Suyatno, S., Maryani, I., Bhakti, C. P., & Ghiffari, M. A. N. (2020).*Students' perception of Higher-Order Thinking Skills (HOTS) learning in West Nusa Tenggara*. https://doi.org/10.1201/9781003035978-43

ISSN: 2654-7198
e-ISSN: 2654-5349

Utaminingsih, R., & Rahayu, A. (2021).*Penggunaan bahan ajar berbasis higher order thinking sklills (hots) dalam mata kuliah pengembanganan pembelajaran ipa sd*. https://doi.org/10.30738/TRIHAYU.V7I2.9168

Wahidin, W. (2023).*Pelaksanaan Evaluasi Pembelajaran Berbasis Higher Order Thinking Skills (HOTS)*. https://doi.org/10.71382/sinova.v1i3.32

White, C. P. (2004). Student Portfolios: An Alternative Way of Encouraging and Evaluating Student Learning.*New Directions for Teaching and Learning*. https://doi.org/10.1002/TL.169

Yolanda, A. (2024).*Strategi Pembelajaran Kontekstual untuk Meningkatkan Pemahaman Konsep Siswa Sekolah Dasar*. https://doi.org/10.61132/pragmatik.v2i3.941