Al-Ishlah: Jurnal Pendidikan
Vol.18, 3 (September, 2026), pp. 4033-4047
ISSN: 2087-9490 EISSN: 2597-940X, DOI: 10.35445/alishlah.v18i3.9931

Evaluating the Gap Between Perception and Implementation of Higher Order Thinking Skills (HOTS) in Islamic Higher Education Institutions

Ramadhoni Aulia Gusli[1], Zulfani Sesmiarni[2], Arifmiboy[3], Muaddyl Akhyar[4], Soibatul Aslamiah Nasution[5]

[1] Universitas Islam Negeri Sjech M. Djamil Djambek, Bukittinggi, Indonesia; ramadhoniauliagusli98@gmail.com
[2] Universitas Islam Negeri Sjech M. Djamil Djambek, Bukittinggi, Indonesia; zulfanisesmiarni@uinbukittinggi.ac.id
[3] Universitas Islam Negeri Sjech M. Djamil Djambek, Bukittinggi, Indonesia; arifmiboy@uinbukittinggi.ac.id
[4] Universitas Islam Negeri Imam Bonjol, Padang, Indonesia; muaddylakhyar@gmail.com
[5] IAI YAPTIP Chadijah Ismail Pasaman Barat, Indonesia; aslamiahs114@gmail.com

ARTICLE INFO

Keywords:

higher order thinking skills;
lecturers' perceptions;
instructional practices;
learning assessment;
Islamic higher education

Article history:

Received 2026-04-26
Revised 2026-06-12
Accepted 2026-09-30

ABSTRACT

Higher Order Thinking Skills (HOTS) are essential for fostering critical, analytical, and creative thinking in higher education. However, discrepancies between lecturers' conceptual understanding and their instructional practices remain a challenge, particularly in private Islamic higher education institutions (PTKIS). This study examines the gap between lecturers' perceptions and the implementation of HOTS in instructional planning, classroom practices, and learning assessment. This study employed a qualitative case study approach involving lecturers from PTKIS in Pariaman City, Indonesia. Data were collected through open-ended questionnaires administered via Google Forms, observations, and document analysis of Semester Learning Plans and assessment instruments. Data were analyzed through reduction, thematic categorization, and conclusion drawing, supported by triangulation across data sources. The findings revealed varying levels of HOTS understanding and implementation among lecturers. Although some demonstrated comprehensive conceptual knowledge and incorporated HOTS-oriented instructional strategies, others relied predominantly on conventional teaching approaches and lower-order cognitive objectives. Discrepancies were particularly evident in assessment practices, where several instruments emphasized remembering, understanding, and applying rather than analyzing, evaluating, and creating. The findings highlight a gap between lecturers' conceptual understanding of HOTS and its integration into instructional and assessment practices. Strengthening pedagogical competence, aligning learning outcomes with HOTS-oriented assessment, and providing systematic institutional support are essential for improving instructional quality in Islamic higher education.

This is an open access article under the CC BY-NC-SA license.

Corresponding Author:
Ramadhoni Aulia Gusli
Universitas Islam Negeri Sjech M. Djamil Djambek Bukittinggi; ramadhoniauliagusli@gmail.com

1. INTRODUCTION

One of the essential competencies in 21st-century education is higher order thinking skills (HOTS) (Zainil, Kenedi, Rahmatina, Indrawati, & Handrianto, 2023). In addition to mastering foundational knowledge, students are also expected to think critically and creatively, solve various problems, and adapt to global challenges, including increasingly complex social issues and technological developments. In line with this, educators are required to be able to develop students' analytical, critical, creative, and innovative abilities in the learning process, particularly in the era of Society 5.0 (Gusli & Charles, 2026). These skills serve as essential preparation for students in facing increasingly intense competition in the job market. Therefore, Islamic educational institutions, particularly Islamic universities, have a responsibility to equip students with these competencies. One approach that can be taken is to create a learning environment that encourages active student engagement through exploration, critical thinking, discovery, and creative problem-solving (Gusli & Sesmiarni, 2025).

In order for students to be able to rekindle their imagination and generate innovative ideas, their critical and creative thinking skills need to be continuously improved (Kardoyo, Nurkhin, Muhsin, & Pramusinto, 2020). Therefore, the implementation of learning that is oriented toward the development of critical and creative thinking is highly effective in enhancing students' higher order thinking skills (Kwangmuang, Jarutkamolpong, Sangboonraung, & Daungtod, 2021; Saad, Mohamad, Ataa, & Amran, 2025). Abilities such as determining what to believe and do, generating new ideas, making predictions, and solving non-routine problems are part of higher order thinking skills (Gupta & Mishra, 2021). One learning approach that encourages students to think critically, analytically, collaboratively, and creatively is Higher Order Thinking Skills (HOTS)-based learning (Gusli & Aprison, 2025). In the implementation of HOTS learning, the instructor's role is no longer that of the sole source of information. Students are encouraged to independently identify and solve problems, while the instructor functions as a facilitator who guides and supports the learning process (Gusli & Ahida, 2025).

Pursuant to Ministry of Education and Culture Regulation No. 3 of 2020, the national curriculum, including the 2013 Curriculum, the KKNI-based curriculum, and the MBKM (Merdeka Belajar Kurikulum Merdeka) curriculum, requires the implementation of learning that is oriented toward higher-order thinking skills (HOTS). In the cognitive domain, levels C-4, C-5, and C-6 represent competency outcomes that need to be developed through HOTS-based learning. This approach emphasizes the ability to analyze (C-4), evaluate (C-5), and create (C-6), with the aim of producing students who possess critical, creative, and innovative thinking skills.

The implementation of HOTS-based learning involves three main stages: planning, implementation, and evaluation. Thus, the initial stage requires planning that includes the development of a Semester Learning Plan (SLP), the creation of instructional materials, the selection of teaching methods, and the use of instructional media as the foundation for applying HOTS (Tyas & Naibaho, 2021). The preparation of the RPS must be aligned with the learning outcomes formulated and established by the national curriculum development team. Subsequently, these learning outcomes are elaborated in greater detail into course learning outcomes (CPMK).

Next, developers formulate indicators based on the established CPMK. These indicators must reflect the characteristics of HOTS-based learning. The next step is the implementation of instruction that remains grounded in HOTS principles. Generally, student-centered learning which is synonymous with the HOTS approach will be effective if the learning process focuses on the learners' (Gusli, Sesmiarni, Lestari, & Akhyar, 2025). Therefore, selecting appropriate learning strategies and methods is crucial. Strategies such as problem-solving and inquiry-based learning have proven effective in encouraging students to develop higher order thinking skills (HOTS).

As a key component of the learning process that serves to observe and assess student learning outcomes, learning evaluation plays a role on par with other learning components. Evaluation also serves as the primary means of measuring and diagnosing learning achievements. Through its diagnostic function, evaluation enables teachers, students, and policymakers to identify various phenomena that arise during the learning process (Ramadhoni Aulia Gusli & Hamdi Abdul Karim, 2024). Additionally,

assessments used to measure learning outcomes can provide a comprehensive overview of the extent to which learning objectives have been achieved. This information is crucial for educators, students, and policymakers in designing improvements and preparing for the learning process in the following academic year. Therefore, to obtain accurate measurement results, valid and high-quality evaluation techniques or assessment instruments are required. Assessment instruments also need to be designed based on HOTS to effectively measure the effectiveness of learning focused on higher-order thinking skills. Both formative and summative assessments should be able to measure students' higher order thinking skills (Akhyar, Batubara, & Deliani, 2024; Amin, Pratama, & Amin, 2023). Thus, assessment instruments should not only evaluate textual thinking abilities but must also be capable of revealing authentic and contextual thinking skills.

HOTS-based learning has not yet fully yielded optimal results. This is supported by various research findings from (Tyas & Naibaho, 2021), which indicate that the planning and implementation of HOTS-based learning in the schools studied remain at a moderate level. Additionally, the study (Mispani, Abrori, Hasyim, Kushendar, & Muslimah, 2021), which mapped the implementation of HOTS across all elementary schools in Medan City, also found that its application still needs improvement. Meanwhile, the findings of the study (Zainil et al., 2023) reveal that most lecturers in Banjarmasin City are not yet prepared to implement HOTS-based learning, particularly in online learning. These findings indicate that the implementation of HOTS still requires strengthening. This is evident from learning practices that generally only reach the middle levels of thinking, such as the ability to apply (C-3) and analyze (C-4).

Therefore, educational institutions including Islamic universities are required to be adaptable and capable of addressing these issues by updating teaching methods and assessment systems that foster the development of higher-order thinking skills. In this regard, faculty members, as key actors in higher education, play a strategic role in ensuring that the concept of HOTS is not only understood theoretically but also effectively implemented in the learning and evaluation processes. Thus, the application of HOTS in education is a crucial step in producing graduates who are not only intellectually outstanding but also capable of adapting to the demands of the evolving times.

However, according to a study by the, the implementation of HOTS in Islamic educational institutions still faces various challenges, even though this concept has garnered significant attention in curriculum discourse at both the national and international levels. One of the main obstacles, particularly in Islamic higher education institutions, is that many instructors have not yet optimized the implementation of HOTS, thereby hindering efforts to encourage students to develop and respond to HOTS-based questions (Syafryadin, Harahap, Haryani, & Astrid, 2021). Although most lecturers acknowledge the importance of HOTS, they still face difficulties in integrating it into the Semester Learning Plan (SLP) or assessment instruments. Furthermore, most research on HOTS has primarily focused on instructional implementation, the use of methods, and the development of instructional materials. Research specifically examining the evaluation of HOTS-based learning or the development of HOTS-based assessment instruments remains relatively limited. On the other hand, empirical studies revealing the extent to which PTKIS lecturers understand and apply HOTS are also scarce. This situation indicates a research gap that warrants further attention. Generally, the effectiveness of learning at PTKIS is highly determined by lecturers' ability to design learning activities that challenge students' critical thinking skills and to develop an assessment system aligned with the characteristics of HOTS. In this context, research that specifically highlights HOTS-based learning evaluation is crucial. Therefore, a more in-depth and critical study is needed regarding the implementation of HOTS in daily teaching practices, particularly in Islamic education.

This study aims to answer three key questions related to this issue. First, what is the level of understanding among PTKIS lecturers regarding the concept of HOTS? This question is posed to identify the extent to which lecturers understand aspects of HOTS such as analysis, synthesis, evaluation, and creativity. Second, to what extent are lecturers able to integrate HOTS into the teaching methods they employ? This question is intended to assess the alignment between conceptual understanding and classroom practice, including in the selection of learning strategies and techniques. Third, what is the

faculty's ability to design assessment instruments that reflect HOTS principles? Through this evaluative aspect, the third question aims to illustrate the depth of faculty understanding of the HOTS concept. By examining these three aspects, this study is expected to provide a comprehensive overview of the implementation of HOTS at PTKIS. The results are expected to serve as a foundation for policy-making and faculty capacity development, to promote pedagogical reform in Islamic education that is more adaptive to the demands of the 21st century and the dynamics of the digital age.

2. METHODS

This study employs a qualitative approach using a case study design (Sugiyono, 2020). Data collection was conducted using observation techniques, a Google Forms-based survey containing open-ended questions, and document analysis. In this context, the document analysis focused on learning materials and learning outcome assessment instruments developed by faculty members. The survey was used to explore lecturers' understanding of HOTS principles, including how they implement and evaluate HOTS-based learning. Meanwhile, document analysis aimed to assess the alignment between responses in the questionnaire and actual practices reflected in official learning documents.

To obtain more in-depth and contextual responses, the questions in the questionnaire were designed as open-ended questions. The questionnaire was distributed via the PTKIS WhatsApp group in Pariaman City, and thirteen 66 lecturers responded. Thus, the total number of participants in this study was 66 lecturers. The primary data sources for this study include Semester Learning Plans (SLPs), assessment instruments developed by lecturers, and respondent answers collected via a Google Forms-based interview questionnaire (Sugiyono, 2018). This study employed open-ended interview questions using a semi-structured approach in the from of an online questionnaire.

In addition to conducting interviews, this study also examined and evaluated various documents, such as the Semester Learning Plan (SLP), assessment instruments, and other supporting documents. The data obtained from the interview questionnaires were then verified through cross-checking with these documents. This process is part of the data triangulation technique, which aims to ensure the reliability and validity of findings in qualitative research. This approach allows researchers to analyze data simultaneously throughout the research process. The initial stage of analysis involves grouping research subjects, various events, information, and specific characteristics obtained during the data collection phase (Sugiyono, 2018).

In addition, the data analysis in this study also followed the three main stages proposed by Miles and Huberman, namely data reduction, data presentation, and verification or drawing conclusions (Miles, Huberman, & Saldana, 2014). These three stages occurred simultaneously and were interrelated throughout the analysis process. The initial stage undertaken by the researcher is data reduction, which includes editing, grouping, and summarizing the data. This stage also involves coding, writing memos, organizing data based on specific themes and patterns, and developing and interpreting ideas emerging from the data. After the data is grouped, the next step is to present the data as field findings. Data is organized according to themes relevant to the theoretical framework (assembling), condensed (compressing) to avoid excessive information, and systematically organized (organizing) (Sugiyono, 2015). Through these stages, the researcher begins to formulate research findings. This process is repeated until valid and reliable results are obtained.

Operationally, the analytical procedures in this study consist of three stages. First, field data were processed and analyzed on a case-by-case basis (in-case analysis) by grouping respondents' answers according to the research questions. Second, the results of this case-by-case analysis were then compared (cross-analysis) with data from various other sources to identify similar patterns or characteristics, which were subsequently formulated as field findings. Third, the findings obtained in the previous stage are further analyzed by relating them to various relevant theories in the literature, then developed and summarized as the final research results. Through this approach, it is hoped that the study will provide an accurate and comprehensive picture of the actual conditions of HOTS implementation at PTKIS, as well as contribute to the development of higher Islamic education policies

and practices that are of higher quality and more contextual. The location of this research is an Islamic higher education institution in the city of Pariaman.

3. FINDINGS AND DISCUSSION

As previously described, this study collected data from a number of lecturers at private Islamic higher education institutions (PTKIS) in the city of Pariaman. The data were obtained from lecturers' responses to open-ended interview questions distributed via Google Forms. The research findings indicate a diversity of data regarding the implementation and evaluation of the learning process at PTKIS in Pariaman City. As a step toward improving the quality of learning, particularly in the development of higher-order thinking skills (HOTS), a structured mapping of the conceptual, implementation, and evaluation aspects of HOTS-based learning is required. This effort aims to gain an understanding of how HOTS is applied in the learning process and its impact on students' cognitive achievements. Therefore, this study focuses on an in-depth analysis of various components related to HOTS, which are then classified to produce a more comprehensive understanding.

The formulation of the research findings is based on several categories, namely: (1) the concept of HOTS, (2) the implementation of HOTS learning and its cognitive outcomes, and (3) the evaluation of HOTS learning. However, before mapping and formulating the results, it is important to note that the responses obtained can be grouped into three categories, as shown in Table 1.

Table 1. Categories of Faculty Responses to the Distributed Questionnaire

Group	Category	Description
1	Consistent Response	Some instructors in this category demonstrated consistency in answering all questions, from the initial understanding of HOTS to the final question. The responses provided reflect accuracy in understanding concepts, offering explanations, selecting teaching methods, and determining the assessment models applied in the learning process. Additionally, respondents in this category also included supporting documents, such as the Semester Learning Plan (SLP) and the assessment instruments used, thereby facilitating the researcher's analysis process.
2	Inconsistent Response	In this category, the responses revealed inconsistencies in several aspects. For example, in the section on HOTS-related reflections, it appears that the instructors have a fairly good understanding of the concept; however, this is not reflected in the evaluation models or the sample questions provided. Additionally, some instructors did not include supporting documents, making it difficult for the researcher to classify them into the first category.
3	Incomplete Response	Some faculty members did not answer all the questions in the questionnaire. This made it difficult for the researcher to accurately classify these respondents into the predetermined categories.

Table 1 presents a classification of faculty responses based on the level of consistency, completeness, and accuracy in answering questions related to the understanding and application of HOTS in teaching. This categorization provides an initial overview of the faculty's level of understanding of the HOTS concept and its implementation in teaching practice. Based on the results of this classification, the subsequent discussion focuses on the three main dimensions that form the focus of this study's analysis. First, the HOTS conceptual aspect, which examines the extent to which instructors understand the basic principles of HOTS and how these concepts are implemented in instructional policies. Second, the implementation of HOTS instruction and its cognitive outcomes, which examines how instructors apply HOTS in instructional practice and its impact on students' cognitive achievements. Third, the evaluation of HOTS learning, which focuses on the analysis of assessment instruments and methods used to measure HOTS achievement, as well as their effectiveness in representing students' higher-order thinking skills. These three aspects will be discussed in greater

depth by referring to the response categories in Table 1, thereby yielding a more complete and comprehensive understanding of HOTS implementation among lecturers.

Based on these three aspects and data collected from PTKIS lecturers in Pariaman City, it is evident that the levels of understanding, implementation, and evaluation of HOTS-based learning vary considerably. To provide a clearer picture of the distribution of these categories, Table 2 presents a summary of the research findings in tabular form.

Table 2. Distribution of Lecturers' HOTS Understanding, Instructional Implementation, and Assessment Practices by Proficiency Level

Research Focus	High Category	Medium Category	Low Category	Amount
Understanding of HOTS Concepts	6 Participants	8 Participants	8 Participants	22 Participants
The Application of HOTS in Education	6 Participants	8 Participants	8 Participants	22 Participants
HOTS-Based Assessment Tools	8 Participants	8 Participants	6 Participants	22 Participants
Amount	20 Participants	24 Participants	22 Participants	66 Participants

Based on Table 2, it can be seen that only a small proportion of lecturers demonstrate comprehensive mastery of all aspects of HOTS. The majority fall into the moderate category, while a significant number fall into the low category, particularly regarding the evaluation aspect. These findings will be discussed in greater depth with reference to the response categories in Table 1, in order to gain a more comprehensive understanding of the implementation of HOTS among lecturers.

3.1 The Concept of HOTS

The responses provided by participants via the Google Forms-based questionnaire regarding their understanding of the HOTS concept can be classified into three categories:

1) First Category
   Respondents in this category were able to provide clear explanations of the HOTS concept. They were also able to identify and use practical terms related to the spectrum of higher-order thinking skills. For example, one instructor explained that HOTS refers to thinking skills that span levels C-4 (analysis) through C-6 (creation) in the cognitive domain according to Bloom's Taxonomy. Another instructor provided a more concise explanation, yet still demonstrated adequate understanding by mentioning technical HOTS terms, such as thinking skills at the analysis through creation stages. Additionally, there was an instructor who demonstrated a more comprehensive understanding by explaining that in the revised Bloom's Taxonomy, HOTS encompasses cognitive levels 4 through 6: analyzing, evaluating, and creating. They also added that HOTS is related to various skills, such as critical thinking, creativity, problem-solving, research skills, innovation, self-management, technology-based collaboration, and the ability to present facts accompanied by reasoning. Based on the diverse responses, it can be concluded that some PTKIS lecturers in Pariaman City in this category have a fairly good level of understanding of the HOTS concept, including the use of practical terms relevant to the HOTS context.
2) Second Category
   In addition to the previous group, there were also a number of instructors who provided general explanations of HOTS without including the technical terms that are an essential part of its definition. Therefore, this category is more appropriately classified as instructors who have a general understanding of HOTS. For example, one lecturer stated that HOTS is a broad, critical, and deep thinking skill, not merely a recording device that simply receives and repeats information. A similar statement was also made by another lecturer who defined HOTS as a thinking skill for addressing complex problems through the processes of analysis, evaluation, and creation. Additionally, some instructors explained that HOTS is a higher-order way of

thinking that does not rely solely on text to solve problems but also involves critical, rational, and creative thinking. Several other instructors also emphasized that HOTS in learning is a process that demands a high level of analysis and thinking. Based on these various responses, it can be concluded that lecturers in this category already possess a basic understanding of HOTS, although this is not yet fully supported by the use of specific technical terminology.

3) Third Category
In addition to the two previous groups, there are also a number of instructors who demonstrate a partial understanding of the HOTS concept, limiting it to the context of creating questions for students. For example, one instructor stated that HOTS is a form of question design aimed at developing students' cognitive abilities so they can think logically, critically, and rationally. Another lecturer interpreted HOTS as question design at cognitive levels C4 through C6. Meanwhile, there were also lecturers who situated HOTS within the context of learning specifically as a process that encourages the use of critical thinking to achieve long-term understanding and the ability to apply it. However, in general, the statements in this category do not yet fully reflect the comprehensive concept of HOTS. In analyzing the data, the researcher used three main variables to identify and formulate the perceptions of PTKIS lecturers in Pariaman City regarding HOTS, namely: (1) reflection, (2) direct explanations provided by lecturers in answering questions, and (3) responses to the cognitive ability targets that constitute learning outcomes.

Based on these various responses, it can be concluded that the understanding of HOTS concepts among PTKIS lecturers in Pariaman City can be grouped into three main categories.

1) First Category: Understanding of the HOTS Concept and Practical Terminology
Instructors in the first category are able to explain HOTS concepts clearly and in depth. In addition to providing comprehensive explanations, they are also able to identify and use practical terminology related to HOTS, such as the grouping of thinking skills based on operational verbs at levels C-4, C-5, and C-6. These explanations are further reinforced by setting cognitive levels C-4 through C-6 as targets in learning outcomes. In assessing the level of understanding of HOTS, the researcher used two main indicators: the ability to provide detailed explanations accompanied by the mention of general characteristics of HOTS, and the use of practical terms relevant to HOTS, particularly operational verbs in Bloom's Taxonomy. Thus, if a respondent met both these indicators, it could be concluded that they possessed a comprehensive understanding of the HOTS concept.

This is consistent with the view (Saraswati & Agustika, 2020), which states that HOTS is an advanced thinking skill involving critical, creative, and contextual analysis processes, falling under levels C-4 (analysis), C-5 (evaluation), and C-6 (creation). Furthermore, (Abidinsyah, Ramdiah, & Royani, 2019) also emphasizes that the concept of HOTS must be reflected in the types of questions used in learning assessments. HOTS encompasses various aspects, ranging from foundational concepts, instructional implementation, methods, to assessment. Thus, a comprehensive understanding of HOTS encompasses all these components.

2) Second Category: General Understanding of the HOTS Concept
Unlike the previous category, in the second group, instructors were able to explain the definition of HOTS quite clearly and in an easily understandable manner. However, some of them had not yet systematically presented practical concepts related to HOTS, such as the classification of operational verbs in Bloom's Taxonomy from levels C-1 to C-6. On the other hand, there were instructors who had set cognitive achievement targets at levels C-4 and C-5 but were not yet able to provide a comprehensive and accurate explanation of the overall HOTS concept. Thus, their understanding of HOTS can be said to be incomplete and not yet systematically organized. Furthermore, this understanding also does not meet the two previously established criteria. Therefore, this group is more appropriately classified as instructors with a general

understanding of HOTS. As indicated by several previous studies, the HOTS concept encompasses various thinking skills such as metacognitive, critical, creative, innovative, and contextual (Ramdiah, Abidinsyah, M.Royani, & Husamah, 2019).

3) Third Category: Partial Understanding of HOTS Concepts
Some instructors in this category understand and explain HOTS only within specific contexts. For example, they interpret HOTS merely as the process of designing questions or solely as a higher-order thinking process that occurs during learning activities. Furthermore, instructors in this group generally do not specify cognitive outcomes at levels C-4 through C-6 as learning objectives. This indicates that their understanding of the HOTS concept remains partial and not yet comprehensive. These perspectives and classifications align with the views of, which state that HOTS is an integral part of all learning components, ranging from thinking concepts, the implementation of learning, to evaluation. Regarding these three categories, it should be noted that the lack of depth in understanding HOTS can be influenced by various factors. Limitations in understanding the concept of HOTS have the potential to hinder the development of higher-order thinking skills (Busdayu, Rahmawati, & Setiadi, 2023). In the context of 21st-century education, the rapid development of science and technology demands that individuals possess higher-order thinking skills. Therefore, students are expected to be able to think critically and possess strong analytical skills in facing various complex challenges and solving problems.

One of the factors hindering the mastery of HOTS concepts is the lack of training and professional development, as some lecturers still face limitations in enhancing their professional capabilities. These obstacles can be influenced by various factors. As explained by (Azwar, Sani, & Abdullah, 2025; Rapih & Sutaryadi, 2018), the low level of HOTS mastery is caused by several obstacles, namely low internal interest, which is generally triggered by a lack of motivation and self-confidence, thereby hindering self-development efforts; resource limitations, such as limited access to reading materials, training, and education; and a lack of information regarding methods or resources that can be utilized for self-development. Time constraints due to a heavy workload, making it difficult to set aside time for learning. Minimal social support, namely a lack of an environment or community that encourages self-improvement. Limited physical or health conditions.

3.2 Implementation of HOTS-Based Learning and HOTS Cognitive Outcomes

The teaching practices of instructors who responded to the questionnaire reveal significant diversity, ranging from the use of conventional methods to the implementation of various learning models that provide students with opportunities to think analytically, creatively, and innovatively. Instructors who have implemented HOTS-based learning generally provide students with broader opportunities to develop higher-order thinking skills. This is reflected in the methods used, such as dialogic discussions, group projects, debates, case studies, problem-solving, the use of analogies, and mind mapping. The application of these methods is also evident in documents such as the Semester Learning Plan (SLP). The presence of these various methods enables students to generate new ideas relevant to real-world problems and aligned with their experiences. On the other hand, there are still instructors who use teaching methods oriented toward lower-order thinking skills, such as memorizing and restating material. The methods used include question-and-answer sessions, note-taking, lectures, and presentations.

These approaches fall under the category of non-HOTS learning because they do not fully encourage students to think at higher levels. Cognitive outcomes in HOTS-based learning reflect students' higher-order thinking skills, particularly in terms of critical thinking to acquire information, creative thinking to solve problems based on existing knowledge, and the ability to make decisions in complex situations. To develop these abilities, various learning activities designed by instructors during the planning stage are necessary to support the achievement of HOTS-based cognitive outcomes. During this planning stage, the implementation of HOTS can be identified through the use

of operational verbs in the Semester Learning Plan (SLP) as well as the instructions listed on the evaluation sheet.

Based on the data obtained, the majority of respondents still use operational verbs in the low-level thinking skills categories, namely C-1, C-2, and C-3. Meanwhile, the use of operational verbs at levels C-4, C-5, and C-6 was found only in a few specific cases. This indicates that the majority of lecturers at PTKIS in Pariaman City still focus on developing thinking skills at the low to intermediate levels. This situation is evident from the use of operational verbs in the Course Syllabus (RPS) and evaluation instruments, which are still dominated by non-HOTS categories (C-1, C-2, C-3). Only a small proportion of lecturers have used operational verbs that encourage students to think at higher levels, namely the HOTS categories (C-4, C-5, and C-6). Thus, lecturers' responses regarding instructional planning to achieve HOTS-based cognitive outcomes can be grouped into three categories: (1) high-level cognitive skills (C-5 and C-6), (2) intermediate-level cognitive skills (C-3 and C-4), and (3) low-level cognitive skills (C-1 and C-2).

In addition to instructors' preparedness during the planning stage to achieve HOTS-based cognitive outcomes, the development of students' cognitive abilities within the learning process also plays a crucial role. Instructors must undertake these efforts to produce high-quality graduates. This development can be achieved by providing students with stimuli and opportunities to practice analytical, critical, and innovative thinking skills. This is reflected in various responses from lecturers when explaining the strategies they implement. For example, one lecturer revealed that they train students through several stages, such as asking them to compare various perspectives, express opinions on a case, strengthen arguments with academic sources, and convey opinions independently based on their knowledge.

Another instructor also stated that they pose questions related to students' daily experiences, explain the relevance of the material being studied, and raise current issues so that abstract concepts become easier to understand in concrete terms. Additionally, they assign project-based tasks, such as presentations, field observations, journal analyses, and hands-on practice. These responses indicate that students are trained to develop critical, analytical, and contextual thinking skills. Furthermore, several other instructors noted that they strive to encourage students to identify core issues and find solutions independently. These efforts are carried out, among other things, through effective discussions to explore ideas and alternative solutions, as well as by encouraging students to examine the development of modern thought in a contextual manner and relate it to the dynamics of an ever-evolving situation. Thus, it can be concluded that the faculty members have essentially made various efforts to enhance students' thinking abilities through the application of diverse teaching methods and the provision of stimuli in the learning process, with the aim of developing higher-order thinking skills.

HOTS-based learning is a complex and comprehensive educational process; therefore, educators or instructors need to design learning materials appropriately to stimulate students' higher-order thinking skills. One crucial aspect that must be considered is the establishment of specific learning objectives that align with the characteristics of HOTS. HOTS-based learning requires students to think at a higher level; therefore, learning objectives must also be formulated using high-level operational verbs such as analyzing, evaluating, and creating (C-4, C-5, and C-6) (Sinta, Roebyanto, & Nuraini, 2022). Learning objectives serve as the primary benchmark for assessing the success of a learning process. To achieve this, instructors need to develop a Semester Learning Plan (SLP) that is systematically integrated with learning objectives based on higher-order thinking skills (HOTS), such as analysis, evaluation, and creation. This aligns with the view (Febriana, Kuntarto, & Alirmansyah, 2020) that states learning quality will improve if planning is designed in accordance with students' cognitive development.

Based on the data obtained in this study, the findings reveal an imbalance. Only a small proportion of lecturers have designed learning activities using HOTS-based operational verbs (C-4, C-5, and C-6). Meanwhile, the majority of lecturers still develop lesson plans and assessment instruments using operational verbs at lower-order thinking levels, namely C-1, C-2, and C-3. Thus, it can be concluded

that most lecturers at PTKIS in Pariaman City still target thinking skills at the low to intermediate levels. This is reflected in the use of operational verbs in the Course Syllabus (RPS) and learning evaluations, which are still dominated by non-HOTS categories (C-1, C-2, C-3). This finding is also consistent with the results of the study, which indicates a similar trend.

Furthermore, the prevalence of low-level operational verbs indicates that instructors' understanding of HOTS concepts is not yet optimal. If instructors possess a deep understanding and are able to integrate HOTS concepts into their teaching practices, they are more likely to use high-order operational verbs when drafting the Course Syllabus (RPS). In line with this, (Lestari, Sesmiarni, & Gusli, 2024) states that conceptual understanding is a key factor in developing appropriate instructional materials for implementation. In analyzing the implementation of HOTS-based learning, the researcher used three main variables, namely: (1) lecturers' reflections and explanations, (2) the variety of learning methods applied, and (3) the most dominant method used in the learning process based on the responses provided. Based on this data, the learning models used by instructors can be classified into two main categories, namely: (a) HOTS-based learning and (b) non-HOTS learning.

1) First Category: Implementation of Higher-Order Thinking Skills (HOTS) Learning
   Some instructors in this category explicitly state that the teaching methods they employ are capable of encouraging students to think critically, analytically, associatively, and innovatively. Teaching models such as dialogic discussions, group projects, debates, case studies, problem-solving, the use of analogies, and mind mapping are approaches that align with Higher-Order Thinking Skills (HOTS)-based learning. These various methods are effective in stimulating students to think more critically, contextually, and creatively. This aligns with the perspective of, which emphasizes that the selection of learning models and methods plays a crucial role in fostering the realization of HOTS-based learning. Through the application of appropriate methods, students have the potential to achieve cognitive abilities up to level C-6 (creating).

   One of the key components of HOTS-based learning is the use of methods that enable students to integrate various higher-order thinking skills. This can only be achieved if the methods used truly support this process. As demonstrated in the study, the problem-based learning approach has proven effective in developing HOTS skills. Thus, if the learning method applied does not provide students with the opportunity to analyze, think creatively, and find solutions to real-world problems, then such learning cannot yet be categorized as HOTS-based learning (Khasanah & Hidayah, 2022).
2) Second Category: Implementation of Non-HOTS Learning
   Unlike the previous category, some instructors in this group tend to employ conventional teaching methods that focus on simple cognitive processes such as recall (C-1) and comprehension (C-2) of course material. As a result, the targeted learning outcomes have not yet reached higher cognitive levels, namely C-5 and C-6. The predominance of these lower-order thinking skills indicates that some instructors have not yet fully grasped the concept of HOTS-based learning. In this context, lecturers still face limitations in developing effective learning strategies, including in selecting methods and designing activities that align with the demands of higher-order thinking skills. Limitations in the implementation of HOTS-based learning can reduce lecturers' ability to provide intellectual challenges to students, thereby limiting students' opportunities to develop higher-order thinking skills. Therefore, support and training are needed for this group of lecturers so that they can understand and implement HOTS-based learning more effectively. Comprehensive training and opportunities to collaborate with fellow lecturers are expected to help overcome these obstacles and improve the effectiveness of HOTS-based learning implementation.

3.3 HOTS-Based Learning Assessment

The learning evaluation models based on the responses of PTKIS lecturers in Pariaman City can be grouped into three categories: (a) HOTS-based evaluation at levels C-5 and C-6, (b) evaluation at

levels C-3 and C-4, and (c) non-HOTS evaluation at levels C-1 and C-2. As an illustration, one lecturer stated that he provided a case study to students and then asked them to: (1) analyze the case, (2) relate it to various relevant literature, and (3) offer solutions and independent perspectives on the issues under study. This approach demonstrates that students are required to conduct analysis, connect theory with practice, and generate solutions all of which fall under higher-order thinking skills (HOTS).

A similar approach is evident in the practices of several other instructors. For example, one instructor assigned an evaluation task asking students to propose the best solutions for effective social interaction. Another instructor asked students as future educators to design strategies to help students more easily understand integer arithmetic operations. Additionally, there are questions that require students to analyze contextual issues, such as the differences between urban and rural Islamic traditions or between modernist and traditionalist groups within large organizations like Muhammadiyah and Nahdlatul Ulama, accompanied by critical arguments. These various examples demonstrate that some instructors have employed assessment tools that encourage students to think critically, analytically, and contextually skills falling under the Higher-Order Thinking Skills (HOTS) category at cognitive levels C-4, C-5, and C-6.

However, there are still a number of lecturers who provide sample questions that fall into the low-order thinking skills categories, namely C-1, C-2, and C-3. For example, there are questions that ask students to explain the characteristics of certain plants and then draw and provide examples of them. Another example is a question that requires students to explain the development of learning methods and their implementation strategies. These responses indicate that the evaluation models developed by PTKIS lecturers in Pariaman City can, in part, be categorized as HOTS-based evaluations; however, others do not yet meet these criteria as they remain at the lower-order thinking level. In assessing and formulating the evaluation models used, this study employed four main variables: (1) questionnaire responses, (2) examples of learning evaluation practices by faculty members, (3) the use of operational verbs in evaluations, and (4) evaluation sheet documents.

Based on the analysis of the data obtained, the learning assessment models applied by PTKIS lecturers in Pariaman City can be classified into three categories, namely: (a) HOTS-based assessment at levels C-5 and C-6, (b) evaluation using middle-order thinking skills (MOTS) at levels C-3 and C-4, and (c) evaluation using lower-order thinking skills (LOTS) at levels C-1 and C-2.

1) First Category: HOTS-Based Assessment Models (C-5 and C-6)
   The data obtained indicate that PTKIS lecturers in Pariaman City who fall into this category are able to assess students' ability to analyze problems, connect theoretical knowledge with real-world situations, and evaluate students' ability to formulate solutions or create new opportunities from the problems presented in learning assessments. These skills fall under the category of higher-order thinking skills (HOTS). In line with the views of the National Center for Higher Education, students' ability to integrate facts and ideas through processes of synthesis, generalization, explanation, analysis, and drawing conclusions is part of higher-order thinking skills. Additionally, the assessment instruments used by this group of instructors also demonstrate the use of operational verbs that reflect the expected cognitive learning outcomes (Mello, Omar, Esa, & Ariffin, 2021).
2) Second Category: Evaluation Models Involving Intermediate-Level Thinking Skills (MOTS) (C-3 and C-4)
   This category includes instructors who use assessment models that do not yet fully focus on higher-order thinking skills at levels C-5 and C-6, but do assess students' abilities at levels C-3 and C-4. This can be seen in the use of operational verbs and the types of questions given to students. Although some questions have shown an effort to assess analytical skills, the form of analysis in question is still limited to activities comparing one concept with another. Thus, the evaluation models in this category have not yet reached the evaluation and creation levels (C-5 and C-6). This aligns with the views of the, which state that Medium Order Thinking Skills

(MOTS) are intermediate-level thinking abilities that generally encompass activities of understanding and applying concepts.

3) Third Category: Evaluation Models Involving Low-Level Thinking Skills (LOTS) (C-1 and C-2)
Some instructors are still found to use forms of learning assessment that measure students' abilities at levels C-1, C-2, and even C-3. The questions provided generally require students to explain concepts, distinguish one thing from another, and complete tasks that still fall within the category of lower-order thinking skills. This assessment model focuses more on the ability to understand, explain, and compare. This aligns with the perspective of, which states that lower-order thinking skills tend to involve convergent thinking activities such as memorization, solving simple problems, and understanding basic concepts. These findings indicate variations in the understanding and implementation of HOTS-based learning, both in teaching practices and in the development of assessment instruments. This situation suggests that strengthening HOTS at PTKIS in Pariaman City is not merely an individual issue for faculty members but is also linked to structural and institutional challenges, such as the lack of a systematically integrated HOTS-based pedagogical training system.

This situation is likely influenced by the continued lack of institutional support for improving the quality of human resources. As noted by the Ministry of Research, Technology, and Higher Education, limited academic mentoring and the heavy administrative burden on faculty members also contribute to the low pedagogical quality, particularly in the implementation of Higher-Order Thinking Skills (HOTS). From an Islamic education perspective, these findings also indicate that the integration between Islamic epistemology and modern learning approaches has not yet been optimally implemented. Yet, in the tradition of classical Islamic education, there is a strong emphasis on critical and reflective thinking, as reflected in the scholarly traditions of the ulama (Aripin, Hamzah, Setya, Hisham, & Ishar, 2020; Saad, Ataa, Mazlan, & Zainol, 2024).

Thus, without a strong conceptual foundation, the HOTS approach risks being understood merely as a technical matter rather than as part of the Islamic scholarly ethos, which emphasizes depth of meaning and intellectual ijtihad. Based on these findings and analyses, there is a need to strengthen curriculum design, particularly at PTKIS in Pariaman City, by emphasizing the integration of HOTS competencies into learning outcomes, syllabi, and course outlines. Additionally, strengthening evaluation standards and academic mentoring are also crucial to ensure that the implementation of HOTS is genuinely realized in teaching practices, not merely listed in RPS documents. Therefore, PTKIS needs to develop a model for faculty training that is not only focused on the technical aspects of HOTS but also integrates them with Islamic values. Some strategic recommendations that can be implemented include the development of an integrated curriculum, faculty training that emphasizes HOTS-based teaching practices aligned with Islamic values, and the formation of a HOTS quality assurance team.

4. CONCLUSION

This study reveals a gap between understanding and the practice of HOTS-based learning among lecturers at Islamic Higher Education Institutions (PTKIS) in Pariaman City. This gap is reflected in the varying levels of lecturers' understanding, as well as in teaching and assessment practices that do not yet fully reflect HOTS principles. As is known, most respondents still design evaluation instruments at low cognitive levels, namely C-1 and C-2. This study contributes to mapping the understanding of HOTS-based teaching practices and evaluation design among PTKIS lecturers, a topic previously rarely examined specifically in private Islamic higher education institutions. Thus, the findings of this study can serve as a foundation for developing faculty capacity-building programs and formulating government policies to promote pedagogical transformation that is of higher quality, innovative, and oriented toward higher-order thinking skills. However, this study has several limitations, including a limited geographical scope, a relatively small number of respondents, and an insufficiently in-depth

examination of institutional factors influencing the implementation of HOTS. Therefore, future research is recommended to expand the study area, increase the number of participants, and examine contextual aspects more deeply, such as pedagogical training, institutional policies, and structural support, to strengthen the implementation of HOTS-based learning in a more comprehensive and in-depth manner.

REFERENCES

Abidinsyah, A., Ramdiah, S., & Royani, M. (2019). The implementation of local wisdom-based learning and HOTS-based assessment : Teacher survey in Banjarmasin. *JPBI (Jurnal Pendidikan Biologi Indonesia)*, *5*(3), 407–414. Retrieved from https://doi.org/10.29333/iji.2019.12128a

Akhyar, M., Batubara, J., & Deliani, N. (2024). The central role of the Quran in the development of the Islamic educational paradigm. *Jurnal Kajian Keislaman Dan Kemasyarakatan*, *9*(1), 26–38. Retrieved from http://dx.doi.org/10.29240/jf.v9i1.9489

Amin, H., Pratama, Y., & Amin, A. H. (2023). Revitalizing Ibn Khaldun ' s Theory of Islamic Education for the Contemporary World. *Al-Ishlah: Jurnal Pendidikan*, *15*(3), 4010–4020. https://doi.org/10.35445/alishlah.v15i3.4523

Aripin, M. A., Hamzah, R., Setya, P., Hisham, M. H. M., & Ishar, M. I. M. (2020). Unveiling a new taxonomy in education field. *International Journal of Evaluation and Research in Education (IJERE)*, *9*(3), 524–530. https://doi.org/10.11591/ijere.v9i3.20458

Azwar, Sani, K., & Abdullah, M. F. R. (2025). The Relevance of al Zarnuji ' s Concepts of Education in Indonesia ' s Merdeka Curriculum. *Al-Irsyad: Journal of Islamic and Contemporary Issues*, *10*(1), 1444–1463. Retrieved from https://doi.org/10.53840/alirsyad.v10i1.475

Busdayu, Z. A., Rahmawati, N., & Setiadi, D. (2023). Implementation of the Problem Based Learning Model Improves High-Order Thinking Skills (HOTS). *Journal of Classroom Action Research*, *5*(4), 449–453. Retrieved from https://doi.org/10.29303/jcar.v5i4.5537

Febriana, A. S., Kuntarto, E., & Alirmansyah. (2020). Teacher's Capability In Planning Higher Order Thinking Skills (HOTS) Learning In Elementary School. *PRIMARY : Jurnal Pendidikan Guru Sekolah Dasar*, *9*(2), 235–249. Retrieved from https://doi.org/10.33578/jpfkip.v9i2.7888

Gupta, T., & Mishra, L. (2021). Higher-Order Thinking Skills in Shaping the Future of Students. *Psychology and Education*, *58*(2), 9305–9311. Retrieved from www.psychologyandeducation.net

Gusli, R. A., & Ahida, R. (2025). Konstruksi ilmu pengetahuan dalam pendidikan Islam aliran empirisme , rasionalisme , positivisme , dan idealisme di era kontemporer. *Idarah Tarbawiyah: Journal of Management in Islamic Education*, *6*(5), 481–502. https://doi.org/10.32832/itjmie.v6i5.21689

Gusli, R. A., & Aprison, W. (2025). Effective Approaches in the Transformation of Madrasahs in the Contemporary Era in West Sumatra. *AR-RASYID: Jurnal Pendidikan Islam*, *5*(2), 242–260. Retrieved from https://doi.org/10.30596/arrasyid.v5i2.27089

Gusli, R. A., & Charles. (2026). Integrasi Model Penafsiran Hermeneutika Al-Qur'an Dan Hadits Di Era Kontemporer Dalam Lembaga Pendidikan Islam. *Al-Muhith (Jurnal Ilmu Al-Qur'an Dan Hadits)*, *5*(1), 65–84. Retrieved from http://dx.doi.org/10.35931/am.v5i1.5669

Gusli, R. A., & Sesmiarni, Z. (2025). Integrasi Penerapan Teknologi Dalam Proses Pembelajaran Mata Pelajaran Pendidikan Agama Islam Di Smkn 1 Kota Pariaman. *An-Nahdlah: Jurnal Pendidikan Islam*, *5*(2), 333–343. Retrieved from http://dx.doi.org/10.35931/am.v5i1.5669

Gusli, R. A., Sesmiarni, Z., Lestari, K. M., & Akhyar, M. (2025). Peran Kepala Madrasah Dalam Pengembangan Mutu Pendidikan Islam Di MTsN 2 Kota Pariaman. *Management of Education: Manajemen Pendidikan Islam*, *11*(1), 41–63. Retrieved from https://doi.org/10.18592/moe.v11i1.15591

Kardoyo, Nurkhin, A., Muhsin, & Pramusinto, H. (2020). Problem-Based Learning Strategy: Its Impact on Students' Critical and Creative Thinking Skills. *European Journal of Educational Research*, *9*(3), 1141–1150. https://doi.org/10.12973/eu-jer.9.3.1141

Khasanah, U., & Hidayah, I. (2022). Meta analysis of learning models in improving Higher Order

Thinking Skills (HOTS) in junior highs school mathematics learning. *Unnes Journal of Mathematics Education*, *11*(1), 58–65. https://doi.org/10.15294/ujme.v11i1.55859

Kwangmuang, P., Jarutkamolpong, S., Sangboonraung, W., & Daungtod, S. (2021). The development of learning innovation to enhance higher order thinking skills for students in Thailand junior high schools. *Heliyon*, *7*(6), 1–13. https://doi.org/10.1016/j.heliyon.2021.e07309

Lestari, K. M., Sesmiarni, Z., & Gusli, R. A. (2024). Strategi Kepala Sekolah Dalam Memotivasi Guru Dalam Meningkatkan Kedisiplinan. *Andragogi Jurnal Pendidikan Dan Pembelajaran*, *7*(2), 713–722. Retrieved from https://doi.org/10.58401/dirasah.v7i2.1227

Mello, G. D. J. P. De, Omar, N. H., Esa, I. I. M., & Ariffin, K. (2021). An Analysis of Higher-Order Thinking Skills (HOTS) in Malaysian University English Test Report Writing. *International Journal of Academic Research in Business and Social Sciences*, *11*(4), 1384–1394. https://doi.org/10.6007/IJARBSS/v11-i4/9837

Miles, Huberman, & Saldana. (2014). *Analisis data kualitattif: buku sumber tentang metode-metode* (3rd ed.). Sage: UIPress.

Mispani, M., Abrori, M. S., Hasyim, U. A. A., Kushendar, K., & Muslimah, M. (2021). Higher order thinking skills (HOTS) and lower order thinking skills (LOTS) on UM-PTKIN questions on Islamic Religious education materials. *Jurnal Iqra': Kajian Ilmu Pendidikan*, *6*(2), 239–260.

Ramadhoni Aulia Gusli, & Hamdi Abdul Karim. (2024). Application of School Financial Management in Managing the Bos Fund in Sdn 09 V Koto Kampung Dalam. *ICMIE Proceedings*, *1*(20), 199–206. https://doi.org/10.30983/icmie.v1i.13

Ramdiah, S., Abidinsyah, M.Royani, & Husamah. (2019). Understanding , Planning , and Implementation of HOTS by Senior High School Biology Teachers in Banjarmasin-Indonesia. *International Journal of Instruction*, *12*(1), 425–440. Retrieved from https://doi.org/10.29333/iji.2019.12128a

Rapih, S., & Sutaryadi. (2018). Elementary school teachers' perspectives on Higher Order Thinking Skills (HOTS): understanding, application and obstacles. *Premiere Education: Jurnal Pendidikan Dasar Dan Pembelajaran*, *8*(1), 78–87. https://doi.org/10.25273/pe.v8i1.2560

Saad, M. F. M., Ataa, N. S. M., Mazlan, N. A., & Zainol, N. Z. N. (2024). Quranic Wisdom Unveiled : Traversing the Higher Order Thinking Skills (HOTs) Elements in the Standard Document for Curriculum and Assessment (DSKP) of Hifz al-Quran in the Integrated Tahfiz Curriculum (KBT). *International Journal of Academic Research in Progressive Education and Development*, *13*(3), 3966–3978. https://doi.org/10.6007/IJARPED/v13-i3/22676

Saad, M. F. M., Mohamad, S., Ataa, N. S. M., & Amran, N. N. (2025). Enhancing Higher Order Thinking Skills (HOTs) in the Tahfiz Integrated Curriculum (KBT): A Qualitative Document Analysis. *Global Journal Al-Thaqafah*, *1*(2), 1–13. Retrieved from https://doi.org/10.7187/GJATSI122025-1

Saraswati, P. M. S., & Agustika, G. N. S. (2020). High-Order Thinking Skills in Solving HOTS Problems in Mathematics Subjects. *Jurnal Ilmiah Sekolah Dasar*, *4*(2), 257–269. Retrieved from https://doi.org/10.23887/jisd.v4i2.25336

Sinta, U. A., Roebyanto, G., & Nuraini, N. L. S. (2022). Analysis of Teachers' Difficulties in Compiling HOTS-Based Evaluation Questions in Mathematics Learning at SDN Torongrejo 2. *Jurnal Pembelajaran, Bimbingan, Dan Pengelolaan Pendidikan*, *2*(1), 45–53. https://doi.org/10.17977/um065v2i12022p45-53

Sugiyono. (2015). *Metode Penelitian Kombinasi (Mixed Methods)*. Bandung: Alfabeta.

Sugiyono. (2018). *Metode Penelitian Kuantitatif*. Bandung: Alfabeta.

Sugiyono. (2020). *Metode Penelitian Kualitatif Bandung*. Bandung: Alfabeta.

Syafryadin, Harahap, A., Haryani, & Astrid, A. (2021). Boosting Classroom Interaction Based on Higher Order Thinking Skills (HOTS) in English Learning for Beginners. *International Journal of Language Education*, *5*(1), 477–489. Retrieved from https://doi.org/10.26858/IJOLE.V5I1.15211

Tyas, E. H., & Naibaho, L. (2021). HOTS Learning Model Improves The Quality of Education. *International Journal of Research -GRANTHAALAYAH*, *9*(1), 176–182. Retrieved from

https://doi.org/10.29121/granthaalayah.v9.i1.2021.3100

Zainil, M., Kenedi, A. K., Rahmatina, Indrawati, T., & Handrianto, C. (2023). The influence of a STEM-based digital classroom learning model and high-order thinking skills on the 21 st -century skills of elementary school students in Indonesia. *Journal of Education and E-Learning Research*, *10*(1), 29–35. https://doi.org/10.20448/jeelr.v10i1.4336