Cognitive Domain Assessment Instrument in Learning at SMA Muhammadiyah 5 Yogyakarta

M. Faqih Syifa Rahman*
Universitas Islam Negeri Sunan Kalijaga Yogyakarta
e-mail: 24204011010@student.uin-suka.ac.id
Nurul Hidayah
Universitas Islam Negeri Sunan Kalijaga Yogyakarta
e-mail: 24204011012@student.uin-suka.ac.id
Suwadi
Universitas Islam Negeri Sunan Kalijaga Yogyakarta
e-mail: suwadi@uin-suka.ac.id

Abstract

This study aims to examine the application of test techniques as an assessment instrument for the cognitive domain in learning at SMA Muhammadiyah 5 Yogyakarta. The background of this research is the importance of assessments that are able to measure the ability to think at a higher level according to the demands of 21st century education. The method used is qualitative descriptive with data collection techniques through observation, interviews, and documentation. Data analysis is carried out using the Miles and Huberman model, which includes data reduction, data presentation, and verification. The results showed that teachers used a combination of objective tests (such as multiple choice) and essay tests to assess students' abilities from low to high cognitive levels based on the revised Bloom Taxonomy. Tests are used not only to assess learning outcomes, but also to provide feedback and improve the learning process. The main challenges faced by teachers include difficulties in compiling HOTS questions, time constraints, and high workloads. To overcome this, schools apply strategies such as question preparation training, collaboration between teachers, and the use of digital technology in the evaluation process. This study concludes that the application of planned test techniques and in accordance with the principles of authentic assessment can increase the effectiveness of cognitive assessment, learning quality, and students' critical thinking skills in the modern education era.

Keywords: Test Technique; Cognitive Assessment; HOTS

Abstrak

Penelitian ini bertujuan untuk mengkaji penerapan teknik tes sebagai instrumen asesmen ranah kognitif dalam pembelajaran di SMA Muhammadiyah 5 Yogyakarta. Latar belakang penelitian ini adalah pentingnya asesmen yang mampu mengukur kemampuan berpikir tingkat tinggi sesuai tuntutan pendidikan abad ke-21. Metode yang digunakan adalah deskriptif kualitatif dengan teknik pengumpulan data melalui observasi, wawancara, dan dokumentasi. Analisis data dilakukan dengan model Miles dan Huberman, yang meliputi reduksi data, penyajian data, dan verifikasi. Hasil penelitian menunjukkan bahwa guru menggunakan kombinasi tes objektif (seperti pilihan ganda) dan tes esai untuk menilai kemampuan siswa dari level kognitif rendah hingga tinggi berdasarkan Taksonomi Bloom revisi. Tes digunakan tidak hanya untuk menilai hasil belajar, tetapi juga untuk memberikan umpan balik dan memperbaiki proses pembelajaran. Tantangan utama yang dihadapi guru meliputi kesulitan dalam menyusun soal HOTS, keterbatasan waktu, dan beban kerja yang tinggi. Untuk mengatasinya, sekolah menerapkan strategi seperti pelatihan penyusunan soal, kolaborasi antarguru, dan penggunaan teknologi digital dalam proses evaluasi. Penelitian ini menyimpulkan bahwa penerapan teknik tes yang terencana dan sesuai prinsip asesmen autentik dapat meningkatkan efektivitas penilaian kognitif, kualitas pembelajaran, serta kemampuan berpikir kritis siswa di era pendidikan modern.

Kata Kunci: Teknik Tes; Asesmen Kognitif; HOTS

INTRODUCTION

In the practice of learning at the high school level, the implementation of cognitive domain assessments still faces various problems that are quite complex. One of the main

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problems is the mismatch between the learning objectives and the assessment instruments used by teachers.[1] Many teachers are still oriented towards the assessment of learning outcomes that emphasize memorization and mastery of facts, not on the ability to think critically, analytically, and creatively as required by the Independent Curriculum.[2] As a result, the assessment has not been able to accurately describe students' high-level thinking skills (HOTS). In addition, teachers' competence in designing valid and reliable assessment instruments is still an obstacle in the field. Some teachers do not have a deep understanding of the principles of preparing questions based on the revised Bloom taxonomy, so there is often an imbalance between low cognitive levels (C1–C3) and high levels (C4–C6).[3] This condition causes the assessment results to be less able to reflect students' complex thinking skills.

Another significant problem is the limited time and workload of teachers in designing, managing, and analyzing assessment results. In many cases, teachers prefer an objective form of test such as multiple choice because it is considered more practical and easy to examine, although it lacks depth in measuring students' thinking ability.[4] In addition, the use of digital technology in cognitive assessment is also still minimal. While various online learning platforms are already available, many schools have not optimized their use to support interactive, adaptive, and data-driven assessments. Lack of training and limited facilities and infrastructure are the main inhibiting factors.

Studies on cognitive assessment instruments in learning at the high school level have been conducted by various researchers with diverse focuses and approaches. In general, the results of previous research show that although cognitive domain assessments have an important role in measuring students' thinking skills, their implementation in the field still faces a number of obstacles, both conceptually and technically. Among other things, research conducted by Mohammad Awad AlAfnan and Mohammad Al found that teachers still tend to use assessment instruments that are oriented towards low-level cognitive abilities. Sari emphasized that most teachers have not fully understood the principles of the revised Bloom taxonomy, so the questions prepared have not been able to measure the ability to analyze, evaluate, and create.[5] This study recommends the need for intensive training for teachers in the preparation of assessment instruments based on higher order thinking skills.

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[1] Razieh Mohammadi et al., "Perceptual (Mis) Matches between Learners' and Teachers' Rating Criteria in the Iranian EFL Writing Self-Assessment Context," *International Journal of Language Testing* 14, no. 1 (2024): 150–65.

[2] Elisabeth Zuska Oroh et al., "Authentic Assessment in Higher Education to Increase Critical Thinking and Develop Metacognitive Awareness," *Studies in English Language and Education* 12, no. 2 (2025): 827–44.

[3] Shafa Ghina Adhaniyah et al., "An Analysis of Exercise Activities And Students' Perception In The Grade Xii English Textbook Merdeka Curriculum Based On The Revised Bloom's Taxonomy," *Jurnal Fakultas Keguruan & Ilmu Pendidikan Kuningan* 6, no. 2 (2025): 62–72.

[4] Aino Ukkonen et al., "Teachers' Understanding of Assessing Computational Thinking," *Computer Science Education* 35, no. 4 (2025): 794–819, https://doi.org/10.1080/08993408.2024.2365566.

[5] Mohammad Awad AlAfnan and Mohammad Al, "Taxonomy of Educational Objectives: Teaching, Learning, and Assessing in the Information and Artificial Intelligence Era," *Journal of Curriculum and Teaching* 13, no. 4 (2024): 173–91.

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Meanwhile, Ping He et al their research examined the validity and reliability aspects of assessment instruments used by teachers. Through the analysis of the question items, they found that only a small fraction of the overall instruments met the standards of good validity and reliability. The main causative factors identified are the lack of academic supervision, lack of training in problem development, and limited time that teachers have to design comprehensive assessment instruments. In another study.[6] Hatice Merve Demirci Berberoğlu through her work emphasized that assessments that are systematically designed and accompanied by reflective feedback can significantly improve students' critical thinking skills.[7] However, the study also highlights implementation challenges in the field, such as the high workload of teachers and the lack of policy support for schools in integrating cognitive assessments into project-based learning. In addition, Mohd Haniff Mohd Tahir in his study sees how important the use of digital technology is in strengthening the effectiveness of assessments. He found that the use of platforms such as Google Form, Quizizz, and Learning Management System (LMS) can increase efficiency, transparency, and facilitate the analysis of student learning outcomes.[8] However, this study also notes that the limitations of technological infrastructure and low digital literacy of teachers are still the main obstacles in the implementation of digital-based assessments.

This research has a fundamental difference as well as novelty compared to previous studies that have discussed cognitive assessment instruments at the high school level. Most of the previous research focused on the conceptual and technical analysis of the preparation of assessment instruments, as well as the extent to which teachers understood the principles of Bloom's taxonomy and higher thinking abilities (HOTS). These studies also emphasize the quality aspects of the instrument, such as validity, reliability, and technical and pedagogical obstacles in its implementation. However, this study has a significant differentiator, namely the focus on the integration between pedagogical, reflective, and digital functions of cognitive domain assessment instruments in the context of real implementation in schools. Unlike previous studies that tended to partially assess assessments, this study examines how assessment instruments not only function as a tool to measure learning outcomes, but also as a tool to form critical thinking processes and students' reflective awareness in learning activities. Another novelty is the emphasis on the ethical and effective integration of digital technologies in the development of cognitive assessments. If the previous research highlighted the efficiency of using digital platforms, this study examines the pedagogical dimension of technology, namely how the digitization of assessments can strengthen students' critical, evaluative, and reflective thinking skills.

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[6] Ping He et al., "School Principals' Instructional Leadership as a Predictor of Teacher's Professional Development," *Asian-Pacific Journal of Second and Foreign Language Education* 9, no. 1 (2024): 63, https://doi.org/10.1186/s40862-024-00290-0.

[7] Hatice Merve Demirci Berberoğlu, *Integrating Reflection Patterns and Strategies through a Documentation Tool into Industrial Design Studio Education for Enhanced Reflective Learning*, Middle East Technical University, 2025, https://open.metu.edu.tr/handle/11511/115406.

[8] Mohd Haniff Mohd Tahir et al., "Online Assessment in Higher Education: A Systematic Literature Review," *Multidisciplinary Reviews*, no. Accepted Articles (2025), https://www.researchgate.net.

RESEARCH METHOD

This study uses a qualitative approach with a descriptive method that aims to understand in depth the application of cognitive domain assessment instruments in the learning process in high school. This approach is considered the most appropriate because it allows researchers to explore phenomena that occur naturally in the field, specifically regarding how teachers design, implement, and evaluate assessments to measure students' thinking skills at various cognitive levels.[9] The focus of the research is not only on the results of the assessment, but also on the pedagogical processes and considerations behind it. The research subjects include subject teachers in high school who actively use various forms of assessment instruments, such as objective tests, essay tests, and project-based assignments.

Data was collected through direct observation of teaching and learning activities, in-depth interviews with teachers and students, and documentation in the form of assessment tools, question grids, and learning evaluation results.[10] The triangulation approach is used to ensure the validity and validity of data by comparing information from various sources and collection methods. Data analysis is carried out using the Miles and Huberman model, which consists of three main stages, data reduction, data presentation, and conclusion or verification.[11] Data reduction is carried out by sorting and grouping data according to the research theme, then presented in the form of a descriptive narrative to facilitate interpretation. The final stage of verification is carried out to find the patterns, relationships, and deep meanings of the research results.

RESULTS AND DISCUSSION
Test Techniques in Cognitive Assessment

Based on the results of interviews with Fiqh teachers at SMA Muhammadiyah 5 Yogyakarta, information was obtained that the use of test techniques as a cognitive assessment instrument has become an important part of the learning process. The Fiqh teacher uses two main types of tests, namely objective tests and essay tests. Objective tests include multiple-choice, true-wrong, and matchmaking questions, each of which is designed to measure students' basic understanding of Fiqh concepts.[12] Meanwhile, essay tests are used to delve deeper into students' abilities to understand, analyze, and evaluate.In practice, multiple-choice questions are structured to reflect learning indicators at low to moderate cognitive levels (C1–

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[9] N Hasnunidah, "Metodologi Penelitian Pendidikan," *Media Akademik*, 2017.

[10] Elmar Hashimov, "Qualitative Data Analysis: A Methods Sourcebook and The Coding Manual for Qualitative Researchers: Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña. Thousand Oaks, CA: SAGE, 2014. 381 Pp. Johnny Saldaña. Thousand Oaks, CA: SAGE, 2013. 303 Pp.," *Technical Communication Quarterly* 24, no. 1 (2015): 109–12, https://doi.org/10.1080/10572252.2015.975966.

[11] Matthew B. Miles, "Qualitative Data Analysis: An Expanded Sourcebook," *Thousand Oaks*, 1994, https://books.google.com.

[12] Ganga Ram Kumal, "Reading Comprehension Ability of Grade Ten Students" (PhD Thesis, Central Department of Education English, 2017), https://elibrary.tucl.edu.np/items/cac1c75a-3154-4bae-962b-eb980352076c.

C3).[13] For example, students are asked to identify the pillars of prayer, understand the legal requirements of fasting, or apply zakat rules in simple cases.

This technique makes it easier for teachers to measure learning outcomes efficiently and provide an overview of students' mastery of the material. In addition, the objective nature of multiple-choice questions allows the assessment process to be carried out quickly and accurately, especially when the number of students in a class is large enough.[14] In contrast to objective tests, essay questions are designed to measure high-level thinking skills (C4–C6) which include analysis, synthesis, and evaluation.[15] The Fiqh teacher said that the essay is used to assess the extent to which students are able to understand the context of Islamic law in real life, as well as how they build arguments based on sharia postulates according to what the students have learned. Through this, teachers can identify the depth of students' understanding as well as their critical and logical thinking skills. The combination of objective tests and essay tests is seen as a balanced and comprehensive strategy in assessing students' cognitive abilities.

With this combination, teachers not only obtain information about mastery of basic concepts, but can also assess the extent to which students are able to apply, analyze, and evaluate the material in the context of life. This approach reflects the application of Bloom's taxonomy in its entirety, from the lowest cognitive level (C1: remembering) to the highest (C6: creating/evaluating).[16] This is very relevant in the learning of Fiqh which not only requires memorization of postulates or rules, but also deep understanding and the ability to apply them wisely. The implementation of test techniques at SMA Muhammadiyah 5 Yogyakarta is designed systematically and planned according to the academic calendar that has been set by. Teachers carry out tests at the end of each chapter, as well as in formal evaluative moments such as the Mid-Semester Exam and the Final Semester Exam. This test aims to determine the overall learning outcomes of students at each learning stage.[17] In addition, some teachers also implement formative assessments in the form of weekly quizzes or daily exercises to monitor the progress of students' understanding on a regular basis. This formative assessment not only serves as a measuring tool, but also as a form of learning that encourages students to remain active and consistent in following the material taught.

In its implementation, the teachers compile a grid of questions as the first step in the assessment process. These grids are a reference in the preparation of questions and are

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[13] Didi Yulistio, "Kemampuan Mahasiswa Menganalisis Tes (Soal) Bahasa Indonesia Sesuai Aspek Ranah Kognitif Model Anderson Dan Krathwohl," *Silampari Bisa: Jurnal Penelitian Pendidikan Bahasa Indonesia, Daerah, Dan Asing* 5, no. 1 (2022): 1–21.

[14] Ummul Qura et al., "Pelatihan Pembuatan Soal Pilihan Ganda Menggunakan Artificial Intelligence Pada Guru-Guru Di SD Muhammadiyah 2 Sukmajaya," *Jurnal Abdidas* 5, no. 3 (2024): 165–73.

[15] Jenifer Raymond R. Tallungan and Demetria A. Corpuz, *Cognitive Test Construction Skills of Prospective Teachers: Ensuring Quality Student Learning Outcomes*, n.d., accessed December 4, 2025, https://nvsu.edu.ph/assets/downloads/journal/vol3-1/NVSURJ_Vol.3_01_2016_4.pdf.

[16] Maya Nurjanah, "Implementasi Lots Dan Hots Pada Soal Tema 3 Kelas 1 Mi/Sd," *Jurnal Evaluasi Dan Pembelajaran* 3, no. 2 (2021): 70–79.

[17] Purwo Haryono, "Examining the Implementation of the Independent Learning Curriculum in English Language Material at Vocational High Schools," *AL-ISHLAH: Jurnal Pendidikan* 16, no. 1 (2024): 295–305.

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adjusted to the achievement indicators that have been designed beforehand. The goal is that the questions given are really able to measure students' abilities in a fair, objective, and proportionate manner in accordance with the learning objectives. In the grid, teachers also pay attention to the proportion of questions based on cognitive levels according to Bloom's taxonomy, such as low-level (C1 and C2), intermediate (C3 and C4), and high-level (C5 and C6) questions.[18] This is done so that the distribution of questions does not only emphasize memorization, but also includes understanding, application, analysis, and evaluation.

Interestingly, in the institutional context of Muhammadiyah, the preparation of questions is not completely carried out individually by teachers or the government. Sometimes, questions are also prepared or made from the Primary and Secondary Education Council (Dikdasmen) of the Muhammadiyah Regional Executive of Yogyakarta City. The questions from this assembly are usually used for UTS and UAS in order to maintain the quality of education standards between Muhammadiyah schools in the region. The questions are prepared by a question preparation team consisting of teachers who are competent in their fields, so as to ensure the validity of the content and reliability of the questions.[19] The existence of this standard also supports the uniformity of student competency achievement and allows schools to map learning achievement regionally.

The Role of Test Techniques in Assessing the Cognitive Domain

Teachers at SMA Muhammadiyah 5 Yogyakarta realize that test techniques do not only function as an evaluation tool, but also as an instrument of diagnosis in the learning process. Through the test results that are thoroughly analyzed, teachers get a concrete picture of the extent of students' understanding of the subject matter.[20] In other words, the test is a mirror of student learning achievement as well as feedback for teachers to assess the success of the learning strategies that have been implemented. The test results provide clear indicators of the parts of the material that the students have mastered and the parts that still need further explanation or strengthening. In addition to being a tool for identifying learning problems, test techniques can also provide quantitative data that is very useful in mapping students' abilities as a whole and individually.[21] With this data, teachers can classify students into certain categories of material mastery, such as excellent, adequate, lacking, or incomplete. This information is then used to develop advanced learning programs, such as enrichment programs for students who have mastered the material and remedial programs for students who are still experiencing difficulties. Thus, the learning process becomes more adaptive to the needs and abilities of students proportionately.

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[18] Atikah Nur Izzah et al., "Eksplorasi Analisis Butir Soal Bahasa Indonesia Di Kelas II Sekolah Dasar Berdasarkan Taksonomi Bloom," *Jurnal Pendidikan Dan Pembelajaran Indonesia (JPPI)* 5, no. 2 (2025): 1031–43.

[19] Ficka Ferdianti et al., "Assasment Pengukuran Anak Berkebutuhan Khusus Secara Akademik," *Student Scientific Creativity Journal* 2, no. 1 (2024): 149–64.

[20] Siti Rohmah, "Peningkatan Pemahaman Siswa Terhadap Materi Thaharah Melalui Metode Demonstrasi Pada Mata Pelajaran Fikih Di Kelas IV MIS Nurul Falah Panyairan, Petir, Serang," *JURNAL Studi Tindakan Edukatif (JSTE)* 1, no. 1 (2025): 84–88.

[21] Rohmah, "Peningkatan Pemahaman Siswa Terhadap Materi Thaharah Melalui Metode Demonstrasi Pada Mata Pelajaran Fikih Di Kelas IV MIS Nurul Falah Panyairan, Petir, Serang."

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The results of the test are one of the main ingredients in teacher evaluation meetings at the school level. In the forum, the teachers jointly discussed student learning outcomes, evaluated the effectiveness of teaching methods, and discussed improvement strategies that need to be made. This process shows that assessment is not only the responsibility of individual teachers, but is part of the collective learning quality control system.[22] Based on test result data, decision-making in improving the quality of learning becomes more directed, objective, and measurable. Therefore, test techniques not only play a role at the grade level, but also support the improvement of the quality of education institutionally.

The test results obtained from students not only provide information about their learning achievements, but also become highly valuable reflective material for teachers in evaluating and improving the learning process. A careful teacher will read more deeply the meaning behind the numbers or grades that emerge from the test results. This reflection can encourage teachers to reassess the effectiveness of teaching methods, approaches used, and the relevance of teaching materials to students' needs and characteristics.[23] This kind of reflection process is essential to maintain a learning dynamic that is responsive and adaptive to the outcomes achieved by students. The transformation of the teaching method based on the results of the evaluation shows that the test technique also plays a role as a diagnostic tool that helps teachers in identifying weaknesses in instructional strategies. When most students are unable to answer questions at a high cognitive level, teachers need to question whether the learning they are doing has really encouraged advanced thinking.[24] Therefore, tests are not only understood as the final measure of learning, but as a trigger for pedagogical improvement and innovation. This is in line with the principle of continuous improvement-oriented learning.

Thus, it can be concluded that test techniques play a dual role in the world of education. On the one hand, it is a reflection of the level of mastery of the material by students, and on the other hand, it is a professional introspection tool for teachers. When teachers use test results to change approaches and enrich teaching methods, the learning process becomes more meaningful, effective, and student-centered.[25] This reflective approach also contributes to the overall improvement of the quality of learning, as teachers not only teach to complete the curriculum, but also to ensure that students understand and are able to process knowledge in depth.

In addition to having an evaluative function, test techniques also have an important role as a tool for providing feedback for students. Through the test results, students can find out the

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[22] Partiwi Ngayuningtyas Adi et al., "Manajemen Perilaku Dalam Pendidikan Inklusi: Isu, Tantangan, Dan Solusi Bagi Guru Dan Siswa," *Consilium: Education and Counseling Journal* 5, no. 2 (2025): 784–800.

[23] Diyanayu Dwi Elviya, "Penerapan Pembelajaran Berdiferensiasi Dalam Kurikulum Merdeka Pada Pembelajaran Bahasa Indonesia Kelas IV Sekolah Dasar Di SDN Lakarsantri I/472 Surabaya," *Jurnal Penelitian Pendidikan Guru Sekolah Dasar* 11, no. 8 (2023), https://ejournal.unesa.ac.id/index.php/jurnal-penelitian-pgsd/article/view/54127.

[24] Suaeb Suaeb, "Penerapan Prinsip Continuous Improvement Dalam Total Quality Management Untuk Meningkatkan Mutu Pendidikan," *Jurnal PenKoMi: Kajian Pendidikan Dan Ekonomi* 5, no. 1 (2022): 12–27.

[25] Fahrudin Fahrudin et al., "Pembelajaran Konvensional Dan Kritis Kreatif Dalam Perspektif Pendidikan Islam," *Hikmah* 18, no. 1 (2021): 64–80.

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extent to which they have mastered the subject matter given.[26] This feedback is crucial in the learning process because it helps students identify their strengths and weaknesses. Thus, test results are not solely an assessment tool, but rather part of the learning process itself, which encourages students to continuously improve and improve their abilities. For example, holding an activity to discuss test results, it also helps students in developing metacognitive skills, namely the ability to think about how they learn. When students are given space to analyze their own mistakes and understand the reasons behind the correct answers, they not only memorize the information, but also build a deeper conceptual understanding. This is one of the forms of active learning that is effective in improving cognitive competence, especially at the level of understanding and application.

Teachers also benefit from this process because they can identify the types of mistakes students often make and improve their teaching approach to specific topics. For example, if many students make similar mistakes in questions about Fiqh or other subjects, then the teacher can review the teaching methods and materials used. This creates a dynamic and responsive learning cycle, where teachers and students alike learn from the evaluation experience.[27] With the open discussion of test results in the classroom, the learning atmosphere becomes more participatory and improving-oriented.[28] Students feel involved in the assessment process and are more motivated to learn because they understand the purpose of each evaluation conducted. This technique also strengthens the relationship between teachers and students because it shows that evaluation is not just a one-sided assessment, but a shared process in achieving complete understanding. Therefore, the use of test techniques as a feedback medium should be maintained and continued to be developed as part of reflective and continuous learning practices.

Obstacles in the Implementation of Test Techniques

One of the significant challenges faced by teachers in the implementation of test techniques as cognitive assessment instruments is the preparation of questions that are in accordance with the level of Bloom's taxonomy, especially at the high cognitive level such as C4 (analysis), C5 (synthesis), and C6 (evaluation).[29] Questions at this level require students to not only remember information, but also to understand, decompose, combine, and assess a concept in depth. Unfortunately, the ability to formulate questions that explore high-level competencies is not fully possessed by all teachers, because it requires a strong pedagogical

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[26] Rohman Rohman et al., "Kemampuan Pemahaman Konsep Pada Pembelajaran Matematika Menggunakan Metode Penemuan Terbimbing Di SMA Negeri 14 Palembang," *Jurnal Penelitian Pendidikan Matematika* 5, no. 2 (2021): 165–73.

[27] Ibnu Sudarmadi, "Utilization of YouTube Media to Increase Student Motivation and Learning Outcomes in Network Systems Administration Subjects: Pemanfaatan Media Yotube Untuk Peningkatan Motivasi Dan Hasil Belajar Siswa Pada Mata Pelajaran Administrasi Sistem Jaringan," *Journal of Vocational Education and Information Technology (JVEIT)* 4, no. 2 (2023): 51–56.

[28] Tika Rahmawati and Herry Sanoto, "The Effectiveness of Class Management-Based Role-Playing Method on The Learning Outcomes of Fifth-Grade Elementary School Students In Pancasila Education," *Eduvest-Journal of Universal Studies* 5, no. 3 (2025): 3056–71.

[29] Tri Haryati et al., "The Effect of Scaffolding and Creative Thinking Skills in an Acid and Base Learning Project on Students' Science Process Skills," *Jurnal Penelitian Pendidikan IPA* 10, no. 3 (2024): 1083–92.

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understanding and creativity in formulating stimuli and question scenarios. This obstacle shows that there is an urgent need to provide training and assistance to teachers in preparing quality assessment instruments, especially those oriented towards higher level thinking skills (HOTS). Teachers need to be equipped with knowledge of context-based question preparation techniques, the use of analytical assessment rubrics, and examples of questions that require logical reasoning, problem-solving, and decision-making.[30] With the increase in teachers' abilities in this case, the quality of the tests used in learning will also be more varied and able to comprehensively reflect student competence.

Furthermore, the challenge in preparing this question also requires support from schools and related institutions, such as the Higher Education Council and the Ministry of Education. The preparation of a joint question bank, a forum for sharing good practices, and collaboration between teachers in designing evaluative questions can be a long-term solution to improve the quality of assessment. Thus, test techniques do not only become administrative routines, but actually serve as valid, reliable, and able to encourage students towards higher-level thinking that is more applicative and contextual.[31]

The process of preparing and implementing tests is an important stage in learning evaluation that requires considerable attention and time from teachers.[32] In the midst of the dense tasks and responsibilities of teachers, ranging from designing learning activities, preparing teaching media, to accompanying students in the teaching and learning process, the preparation of questions is often a challenge in itself. Teachers are required to be able to prepare questions that are not only in accordance with the learning objectives, but also valid in terms of content and able to measure students' cognitive abilities as a whole. This becomes even more complex when teachers have to do it for a limited time and in conjunction with other administrative responsibilities. Limited time in the preparation and implementation of tests often causes the process to be carried out less than optimally. The implementation of the test also requires good coordination so that it runs smoothly, especially when it is carried out on a large scale such as midterm exams or end-of-semester exams.[33] This pressure on time efficiency can have an impact on the quality of the test instruments prepared and affect the validity of student evaluation results.

Nonetheless, the development of educational technology today has provided practical solutions in the assessment process. At SMA Muhammadiyah 5 Yogyakarta, the school has utilized a digital platform or certain website as a medium for conducting tests. With an online-based system, teachers no longer need to make manual corrections for each answer, especially on objective questions such as multiple choice or completely wrong. Correction automation

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[30] Naelatul Markhamah, "Pengembangan Soal Berbasis HOTS (Higher Order Thinking Skills) Pada Kurikulum 2013," *Nusantara: Jurnal Pendidikan Indonesia* 1, no. 2 (2021): 385–418.

[31] Riko Al Hakim et al., "Validitas Dan Reliabilitas Angket Motivasi Berprestasi," *FOKUS (Kajian Bimbingan & Konseling Dalam Pendidikan)* 4, no. 4 (2021): 263.

[32] Edy Herianto et al., "Pelatihan Penyusunan Alat Evaluasi Non Tes Bagi Guru Madrasah Di Mataram," *Jurnal ABDINUS: Jurnal Pengabdian Nusantara* 5, no. 2 (2021): 428–40.

[33] Putu Gede Wisnu Permana Kawisana et al., "Pemahaman Sistem Informasi Memoderasi Hubungan Kompleksitas Audit Tekanan Anggaran Waktu Dan Pengalaman Auditor Terhadap Kualitas Audit," *JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi) Undiksha* 14, no. 02 (2023): 394–400.

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through this website allows teachers to obtain evaluation results quickly, accurately, and efficiently. In addition, students can also find out their scores immediately after the test is completed. The use of technology in this evaluation process certainly has a positive impact on the effectiveness and efficiency of teacher performance. Time that was previously spent checking answer sheets can now be diverted to reflection activities, analysis of student learning outcomes, or learning follow-up planning. However, it is important for teachers to maintain the quality of the questions prepared, both in digital and print formats, so that the assessment remains meaningful and reflects the students' cognitive abilities as a whole. Therefore, the integration between pedagogic skills and digital literacy is an important thing that needs to be continuously developed by educators in this modern learning era.

Test Quality Improvement Strategies

One of the strategic steps taken by the school at SMA Muhammadiyah 5 Yogyakarta, to overcome challenges in the preparation of questions is to organize routine training on the preparation of questions based on HOTS (Higher Order Thinking Skills).[34] This training is structured to improve teachers' understanding and skills in designing assessment instruments that are able to measure high-level thinking skills, such as the ability to analyze information, synthesize ideas from various sources, and evaluate arguments and solutions. This effort reflects the school's commitment to improving the quality of assessment as an integral part of improving the quality of learning. Through this training, teachers not only gain conceptual knowledge about the HOTS theory, but are also given technical guidance in preparing problems that require logical and critical thinking. The training process usually includes practice sessions on question formulation, group discussions, and case studies from validated sample questions. Teachers are invited to understand how to distinguish between questions that test memorization skills and questions that test analytical or evaluation skills.[35] Thus, teachers are more skilled in designing questions that not only assess learning outcomes, but also encourage students to think deeply.

In addition to developing the ability to design HOTS questions, this training also provides knowledge about the question validation process so that the instrument prepared is really able to measure the expected competencies.[36] Teachers are trained to identify question indicators that are in accordance with learning objectives and revise questions based on input from peers. No less important, this training also equips teachers with objective and fair assessment techniques, including the use of assessment rubrics in essay questions. This rubric helps teachers in providing more standardized and transparent assessments. This training on the preparation of HOTS questions is expected not only to improve individual teacher competence, but also to build a collaborative academic culture in the school environment. Teachers who

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[34] K. Arafah et al., "The Development of Higher Order-Thinking Skills (HOTS) Instrument Assessment in Physics Study," *Journal of Physics: Conference Series* 1899, no. 1 (2021): 012140, https://iopscience.iop.org/article/10.1088/1742-6596/1899/1/012140/meta.

[35] Muhammad Yusuf Salam et al., "Aplikasi Quizizz Berpengaruh Atau Tidak Untuk Meningkatkan Motivasi Belajar Dan Hasil Belajar Siswa," *Jurnal Basicedu* 6, no. 2 (2022): 2738–46.

[36] Giati Anisah and Ari Abi Aufa, "Pelatihan Pengembangan Instrumen Asesmen Berbasis Literasi Untuk Guru," *Bubungan Tinggi: Jurnal Pengabdian Masyarakat* 4, no. 4 (2022): 1095–102.

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have participated in the training are expected to become agents of change who are able to share their knowledge and skills with their peers. In the long term, this activity will strengthen the institutional capacity of schools in organizing quality assessments that are relevant to the demands of the curriculum.[37] Thus, this kind of training is an important investment for improving teacher professionalism as well as improving the quality of student learning outcomes.

As an effort to improve the quality of learning evaluation instruments, SMA Muhammadiyah 5 Yogyakarta encourages teachers to work collaboratively in preparing questions, especially at important moments such as mid-semester exams (UTS) and final semester exams (UAS). This collaboration is carried out by forming a question preparation team consisting of teachers of similar subjects. With this teamwork model, teachers do not only work individually, but are involved in the process of discussion, sharing experiences, and correcting and improving the problems that have been designed. Being collaborative in the preparation of this question provides a number of strategic benefits. First, teachers can provide constructive input to each other regarding the clarity, level of difficulty, and relevance of the questions to the learning indicators. In team discussions, questions can be reviewed together to ensure that each test question truly measures the targeted competencies, both in terms of the scope of the material and the desired cognitive level according to Bloom's taxonomy. Thus, the assessment results obtained by students become more valid and representative of the achievement of learning objectives.

SMA Muhammadiyah 5 Yogyakarta has shown positive things towards technological developments by utilizing a website-based digital platform for online test implementation. The use of this technology is a strategic step in answering the challenge of the efficiency and effectiveness of learning evaluation in the digital era.[38] This platform is widely used in the implementation of various forms of tests, both formative and summative, with features that support question management, timing, and automatic reporting of test results. This allows for more flexible assessment implementation, especially in conditions that require distance learning or blended learning. One of the main advantages of using this technology lies in the system's ability to correct test results instantly, especially for objective questions such as multiple-choice, true-wrong, or matchmaking. The automated correction process not only speeds up the recapitulation time of grades, but also minimizes the potential for errors in assessment. Teachers are no longer preoccupied with time-consuming administrative work, so they can focus more on analyzing learning outcomes and reflecting on the learning process. This practicality is a real solution for teachers in managing the classroom.

Overall, the use of technology in the implementation of tests at SMA Muhammadiyah 5 Yogyakarta is not only about changing the media from paper to screen, but also part of the transformation of learning evaluation to be more modern and responsive. This technology integration encourages teachers to be more adaptive to the demands of the times, while

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[37] Nanang Wijaya and Ahyar Yuniawan, "Efektivitas Pembelajaran Online Pada Pegawai Di Lingkungan Pemerintahan Kabupaten Grobogan," *Scholaria: Jurnal Pendidikan Dan Kebudayaan* 12, no. 2 (2022): 168–81.

[38] Muh Ibnu Sholeh et al., "Application Of Islamic-Based Management Principles For Improving Teacher Professionalism," *JPEM: Journal of Perspectives on Educational Management* 1, no. 1 (2025): 1–12.

opening up space for innovation in assessment practice.[39] With proper management, the implementation of digital platforms not only supports the effectiveness of assessments, but also improves the quality of the overall teaching and learning process. This shows that technology, when used optimally, can be a strategic medium in creating more meaningful learning and oriented towards the development of students' competencies

CONCLUSION

Research on Cognitive Assessment Instruments in Learning at SMA Muhammadiyah 5 Yogyakarta shows that the implementation of cognitive assessment has been carried out quite systematically, but it still needs to be strengthened in the aspects of planning, instrument development, and evaluation implementation. Teachers have used various forms of instruments, such as objective tests, description tests, and assignments, which are adjusted to the characteristics of the material and the level of ability of students. However, the quality of the instrument has not yet fully met the ideal standards of validity, reliability, and scalability to comprehensively map cognitive abilities. The results of the study also confirm that teachers' understanding of the taxonomy of the cognitive domain is still at the intermediate level, so that it affects the accuracy of the preparation of indicators and question items. In addition, the integration of assessment with the learning process has not been optimal, especially in utilizing assessment results as a basis for improving learning strategies. Thus, this study concludes that although the cognitive domain assessment at SMA Muhammadiyah 5 Yogyakarta has been carried out functionally, it is necessary to increase the capacity of teachers in the development of instruments, understand cognitive taxonomy, and utilize assessment results to improve the quality of the learning process and outcomes in a sustainable manner.

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[39] Muhammad Khakim Ashari et al., "Model E-Asesmen Berbasis Aplikasi Pada Sekolah Menengah Atas Di Era Digital: Systematic Literature Review," *TA'DIBUNA: Jurnal Pendidikan Agama Islam* 6, no. 2 (2023): 132–50.

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