



FACTORS BEHIND LOW TKA ACHIEVEMENT AMONG SENIOR HIGH SCHOOL STUDENTS

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ABSTRACT. *The Academic Competency Test (Tes Kemampuan Akademik, TKA) is designed to assess students' academic competencies and provide an overview of their readiness for further education. However, variations in national TKA scores across subjects highlight the need to examine factors that may be associated with students' performance. This study aimed to identify factors potentially associated with academic achievement and examine their relevance to TKA performance among Indonesian senior high school students through a literature review. The synthesis identified ten themes comprising four internal factors: difficulties in answering higher-order thinking skills (HOTS) questions, limited literacy and numeracy skills, academic anxiety, and low learning motivation; and six external factors: misalignment between classroom learning and TKA requirements, post-pandemic learning loss, students' socioeconomic conditions, limited simulation and familiarity with the computer-based assessment system, teachers' pedagogical competence and readiness to implement HOTS-oriented learning, and gaps in curriculum implementation. These findings highlight several aspects that warrant attention in improving learning and academic assessment. However, because most of the reviewed studies examined academic achievement in general or assessments other than TKA, these factors cannot be considered established causes of low TKA scores. Further research using TKA-specific data is needed to examine the relationships between these factors and students' performance.*

Keywords: *Academic Achievement, Academic Competency Test, Higher-Order Thinking Skills, Literacy, Numeracy*

ABSTRAK. Tes Kemampuan Akademik (TKA) dirancang untuk mengukur kompetensi akademik siswa dan memberikan gambaran mengenai kesiapan mereka melanjutkan pendidikan ke jenjang yang lebih tinggi. Namun, variasi nilai TKA nasional antar mata pelajaran mendorong perlunya kajian terhadap faktor-faktor yang mungkin berkaitan dengan capaian siswa. Penelitian ini bertujuan mengidentifikasi faktor-faktor yang berpotensi berkaitan dengan prestasi akademik dan mengkaji relevansinya terhadap capaian TKA siswa SMA di Indonesia melalui tinjauan pustaka. Hasil sintesis mengidentifikasi sepuluh tema yang terdiri atas empat faktor internal, yaitu kesulitan menjawab soal berbasis higher-order thinking skills (HOTS), keterbatasan literasi dan numerasi, kecemasan akademik, serta rendahnya motivasi belajar; dan enam faktor eksternal, yaitu ketidaksesuaian pembelajaran di kelas dengan tuntutan TKA, kehilangan kesempatan belajar pascapandemi, kondisi sosial ekonomi siswa, terbatasnya simulasi dan pengenalan sistem asesmen berbasis komputer, kompetensi pedagogis dan kesiapan guru dalam menerapkan pembelajaran berorientasi HOTS, serta kesenjangan implementasi kurikulum. Temuan ini menunjukkan sejumlah aspek yang perlu diperhatikan dalam upaya meningkatkan kualitas pembelajaran dan asesmen akademik. Namun, karena sebagian besar penelitian yang ditelaah membahas prestasi akademik secara umum atau asesmen selain TKA, faktor-faktor tersebut belum dapat dianggap sebagai penyebab rendahnya nilai TKA. Penelitian lebih lanjut menggunakan data spesifik TKA diperlukan untuk menguji hubungan antara faktor-faktor tersebut dan capaian siswa.

Kata Kunci: Prestasi Akademik, Tes Kemampuan Akademik, Higher-Order Thinking Skills, Literasi, Numerasi

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INTRODUCTION

The Academic Competency Test (TKA), introduced by Indonesia's Ministry of Primary and Secondary Education (Kemendikdasmen), provides a standardized assessment of students' academic achievement (Kemendikdasmen, 2025). The competencies assessed are relevant to students' preparation for further education and the world of work, where literacy, numeracy, conceptual understanding, and reasoning are essential (Lestari & Hindun, 2024; Naibaho et al., 2022). Understanding the factors associated with TKA achievement is therefore important for identifying students' academic challenges and informing efforts to improve their assessment readiness.

The 2025 TKA results reported national mean scores of 55.38 for Indonesian Language, 36.10 for Mathematics, and 24.93 for English among participants in senior secondary education and equivalent pathways (Ministry of Primary and Secondary Education, 2025). Although these results show differences in mean achievement across subjects, they do not independently establish the proportion of students with low achievement or explain the factors associated with their performance. The 2022 Programme for International Student Assessment (PISA) also showed that Indonesian students' reading and mathematics performance remained below the OECD average (OECD, 2023). While PISA and TKA differ in their assessment frameworks and purposes, PISA provides broader contextual evidence of academic competency challenges in Indonesia. Previous research has reported difficulties in mathematical conceptual understanding (Demanda et al., 2024), reading comprehension and information interpretation (Fasirah et al., 2024), and the development of literacy skills through exposure to informative and argumentative texts (Sulfayanti, 2023).

Academic competencies are closely related to the ability to interpret information, apply concepts, and solve contextual problems. Students may experience difficulties with numeracy and questions requiring reasoning and decision making (Wahyuni & Himmah, 2024), particularly when they have limited opportunities to apply concepts to real-life situations and solve higher-order thinking skills (HOTS) questions (Anggraini & Setianingsih, 2022). These challenges may also be associated with learning conditions, including instructional strategies, teachers' pedagogical competence, and access to appropriate learning resources. Some teachers experience difficulties implementing HOTS-oriented instruction because of limited understanding, administrative demands, and inadequate resources (Agusta & Sa'dijah, 2021). Consequently, classroom activities that



emphasize routine exercises over analysis and problem solving may provide fewer opportunities for students to practise the skills required in complex assessments (Saraswati & Agustika, 2020).

Psychological factors may also be associated with students' assessment performance. Academic anxiety may affect concentration, while self-confidence and learning motivation may influence engagement with challenging tasks. Previous studies have examined academic anxiety in cognitively demanding tests (Putra & Yulanda, 2021) and psychological conditions in academic contexts (Abidin, 2025). However, these relationships do not necessarily indicate causal effects or directly explain low TKA achievement.

Previous research has explored students' difficulties in mathematical understanding and reading comprehension (Demanda et al., 2024; Fasirah et al., 2024), HOTS-oriented instructional practices (Agusta & Sa'dijah, 2021; Saraswati & Agustika, 2020), and psychological factors related to academic performance (Putra & Yulanda, 2021). Other studies have examined socioeconomic conditions, learning opportunities, and pandemic-related learning disruptions. However, these findings do not establish direct relationships with TKA performance. Therefore, this study synthesizes literature on ten factors potentially associated with academic achievement, examines their relevance to TKA performance among Indonesian senior high school students, and describes national TKA scores reported for 2025 to identify priorities for further research.

METHODOLOGY

Research Design and Literature Search

This study employed a literature review approach to examine factors associated with low Academic Competency Test (TKA) achievement among Indonesian senior high school students. Literature searches were conducted through Google Scholar using combinations of keywords related to TKA, academic achievement, literacy, numeracy, higher-order thinking skills (HOTS), instructional practices, and psychological factors. Official reports from Indonesia's Ministry of Primary and Secondary Education (Kemendikdasmen) were also consulted to provide context for national TKA achievement. The review focused on academic, learning-related, and psychological factors.

Study Selection

The study selection process followed the PRISMA 2020 framework (Figure 1). The initial search identified 910 records. After 110 duplicate records were removed, 800 records remained for title and abstract screening. Of these, 650 records were excluded as irrelevant to the review objectives. The full texts of the remaining 150 reports were assessed for eligibility, and 120 were excluded because they did not meet the predefined inclusion criteria. Consequently, 30 studies were included in the literature synthesis. Eligible studies addressed one or more aspects of academic achievement, student competencies, psychological factors, instructional conditions, socioeconomic circumstances, or assessment-related experiences. Official TKA reports were used separately as contextual sources for describing national assessment results and were not automatically counted among the 30 included studies.

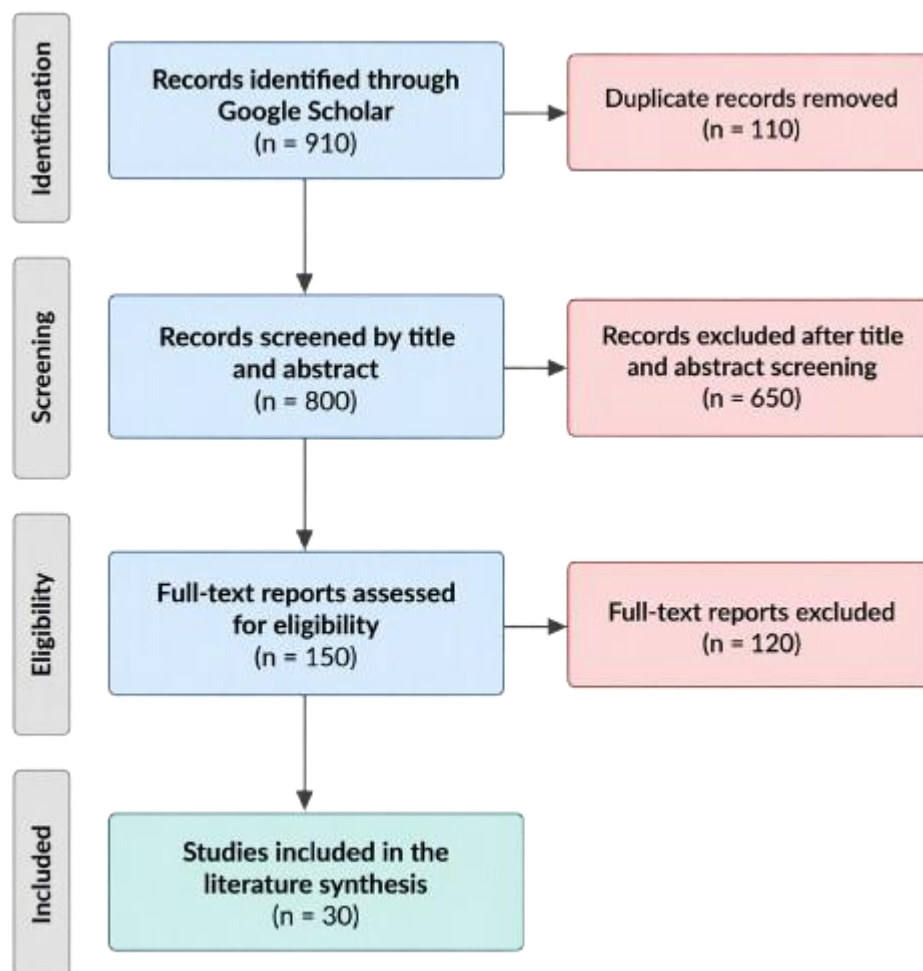


Figure 1. PRISMA Flow Diagram of the Literature Selection Process



Data Extraction and Synthesis

Data were extracted from the 30 included studies, focusing on study context, population or educational level, factors examined, assessment context, and principal findings. The literature was reviewed and synthesized according to its relevance to the research topic (Chika et al., 2022; Sukmojati et al., 2026). A narrative synthesis was conducted by comparing the findings across studies to identify recurring themes and their potential relevance to academic achievement. The synthesis was organized into ten factors, subsequently grouped into internal and external factors for presentation in the Results and Discussion sections. Studies examining general academic achievement or other assessments were distinguished from those directly investigating TKA performance. Official TKA scores were summarized descriptively and used as contextual data rather than as evidence of causal relationships. Accordingly, the identified factors were interpreted in relation to the available literature, with consideration of differences in study populations, assessment contexts, and the directness of the evidence.

RESULTS

Literature Review Findings

The narrative synthesis of the 30 included studies identified ten themes potentially associated with academic achievement among secondary school students. These themes were organized into four internal factors related to students' competencies and psychological readiness, and six external factors related to instructional practices, learning conditions, socioeconomic circumstances, and assessment experiences. Table 1 summarizes the ten factors and the principal insights from the literature discussed in this review. Because the included studies differed in their populations, research designs, and assessment contexts, the findings indicate areas of potential relevance to TKA performance rather than establishing direct causal relationships with national TKA scores.

**Table 1.** Synthesis of Internal and External Factors Associated with TKA Achievement

Factor Group	Factors Discussed	Synthesis of Literature	Sources Cited in the Discussion
Internal Factors	Students' inability to answer higher-order thinking questions (HOTS)	Difficulties in analysis, evaluation, and non-routine problem-solving may be relevant to performance on reasoning-oriented assessments.	Pamungkas et al. (2025); Fitri and Abadi (2021); Stacey and Turner (2014); Kappassova et al. (2025)
	Low basic literacy and numeracy skills	Literacy and numeracy support the interpretation of information, understanding of problem statements, and application of concepts in complex tasks.	Reflina (2023); Wahyuni and Himmah (2024)
	Academic anxiety	Academic anxiety may be associated with difficulties in concentration and academic performance under assessment pressure.	Farrasia et al. (2023); Daony et al. (2025)
	Low learning motivation	Learning motivation may be associated with students' persistence, self-regulation, and willingness to practise academic skills.	Subekti and Kurniawan (2022); Lisnasari et al. (2025)
External Factors	Gap between classroom learning and TKA requirements	Differences between classroom learning activities and assessment demands may limit opportunities to practise analytical and integrative reasoning.	Ridha et al. (2025); Fulmer and Polikoff (2014); Hong et al. (2019)
	The phenomenon of post-pandemic learning loss	Pandemic-related learning disruptions may have affected learning continuity and the development of foundational academic competencies.	Meilani et al. (2021); Cortés-Albornoz et al. (2023); Wisenoecker et al. (2025)
	Students' socioeconomic conditions	Differences in learning resources, family support, tutoring access, and digital facilities may contribute to unequal learning opportunities.	Sirin (2005); Van Deursen and Van Dijk (2019); Yigiter (2025); Reardon (2011)



Lack of simulation and adaptation to the CAT system	Limited familiarity with computer-based assessment and time-management demands may affect students' test readiness.	Fu et al. (2025); Paas and Van Merriënboer (2020); Putwain et al. (2019)
Pedagogical competence and teacher readiness in implementing HOTS-based learning	Limited pedagogical knowledge, learning resources, and professional training may constrain teachers' implementation of HOTS-oriented learning.	Agusta and Sa'dijah (2021); Saraswati and Agustika (2020); Darling-Hammond et al. (2017); Hattie (2009)
Curriculum Implementation Gaps	Gaps between curriculum objectives and classroom practices may limit opportunities for students to develop reasoning and solve contextual problems.	Soleman (2020); OECD (2023)

The literature synthesis indicates that student achievement is discussed in relation to both individual and educational factors. Academic competencies, including literacy, numeracy, and HOTS, represent one group of factors, while psychological readiness encompasses academic anxiety and learning motivation. Other themes concern classroom practices, teacher competence, curriculum implementation, socioeconomic circumstances, and familiarity with computer-based assessment systems. These categories provide an overview of the factors addressed in the reviewed literature. However, findings from studies examining general academic achievement or other assessments should be distinguished from direct evidence concerning TKA performance.

Overview of TKA Scores Across Subjects

Official national TKA results provide additional context for interpreting academic achievement across subjects. The average Academic Competency Test (TKA) scores for 2025 are presented in Figure 2. The mean scores were 55.38 for Indonesian Language, 36.10 for Mathematics, and 24.93 for English. Among other subjects, the mean scores were 70.43 for Anthropology, 70.36 for Geography, 68.02 for Advanced Indonesian Language, 54.40 for Biology, 60.07 for Sociology, and 62.72 for History. These results indicate variation in mean scores across subjects. However, differences in subject content, assessment demands, and participant characteristics should be considered when interpreting the results. The score data

alone cannot explain the observed differences or establish that any of the ten factors identified in the literature caused these patterns.

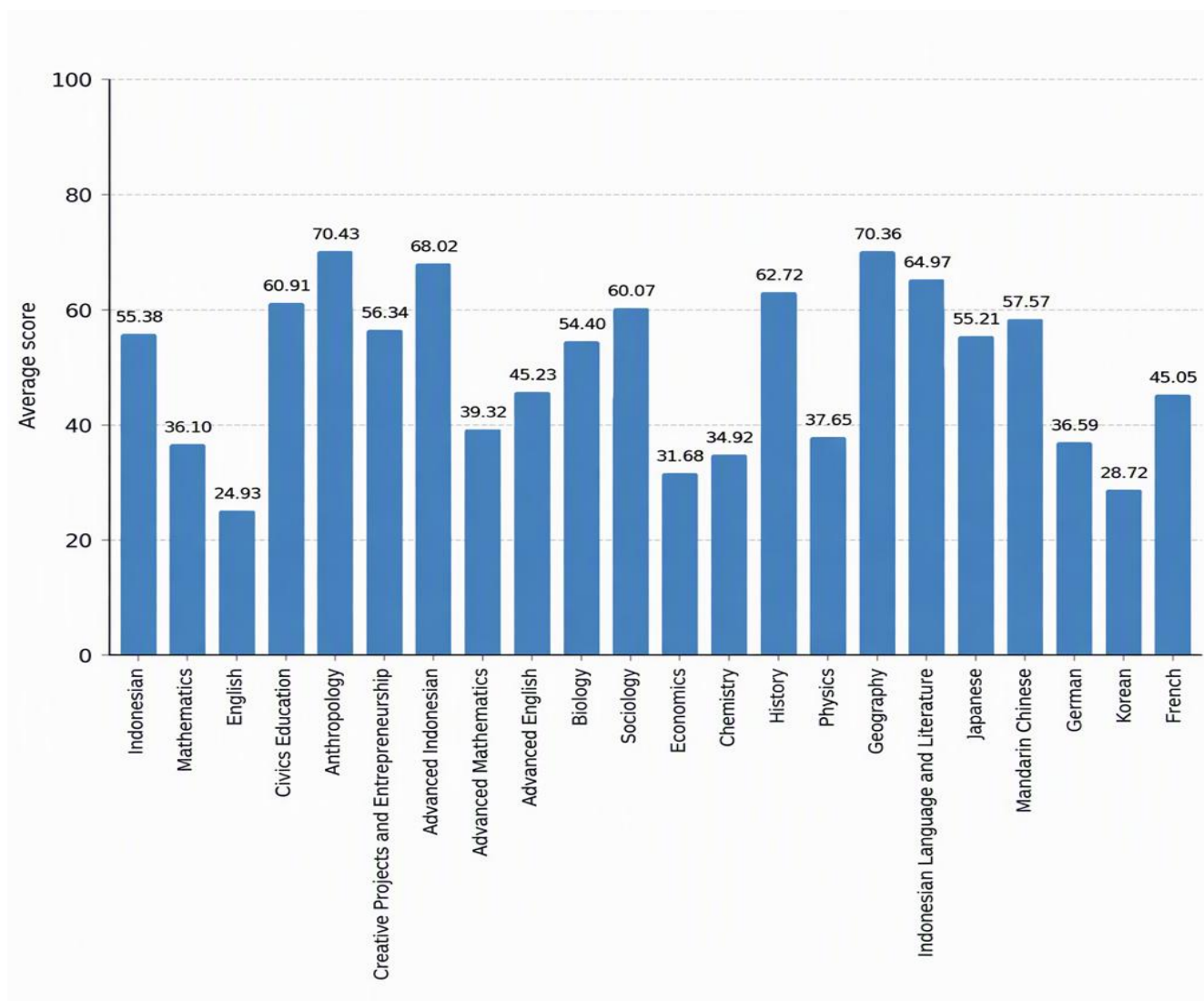


Figure 2. Average Academic Competency Test (TKA) scores of high school students in various subjects in 2025 (Source: Pusat Asesmen Pendidikan, Kementerian Pendidikan Dasar dan Menengah, 2025)

The score distribution provides a descriptive overview of subject-level achievement but does not directly identify the factors underlying these differences. In particular, the graph does not establish whether variations in scores are associated with students' literacy, numeracy, HOTS, academic anxiety, learning motivation, instructional practices, or socioeconomic conditions. Further evidence is therefore needed to determine the relationship between these factors and TKA performance.



Summary of the Main Findings The findings combine a literature synthesis identifying six categories of factors associated with student achievement and a descriptive overview of national TKA scores in 2025. Among the compulsory subjects, Indonesian Language recorded an average score of 55.38, Mathematics 36.10, and English 24.93. Higher average scores were observed in Anthropology (70.43), Geography (70.36), and Advanced Indonesian Language (68.02), while Biology, Sociology, and History recorded scores of 54.40, 60.07, and 62.72, respectively. These results demonstrate variations in achievement across subjects, with English recording the lowest average score among the compulsory subjects.

The literature synthesis identified academic, psychological, instructional, curriculum-related, socioeconomic, and assessment-related factors as relevant themes in research on student achievement. These factors include literacy, numeracy, HOTS, academic anxiety, learning motivation, teaching practices, curriculum implementation, access to learning resources, and readiness for computer-based assessments. Although these themes provide a broader context for understanding student achievement, the aggregate TKA scores alone cannot establish whether or how each factor contributes to students' performance. Further empirical research is needed to examine these relationships specifically in the context of TKA.

DISCUSSIONS

The literature synthesis indicates that academic achievement may be associated with a combination of student-related characteristics and educational conditions. In this review, ten factors were organized into two broad categories: four internal factors involving students' academic competencies and psychological readiness, and six external factors involving instructional practices, learning conditions, socioeconomic circumstances, and assessment experiences. These themes provide a framework for understanding challenges that may be relevant to TKA performance. However, the evidence must be interpreted in light of the different contexts examined by the included studies. Many studies investigated general academic achievement or other assessments rather than TKA specifically. Therefore, the factors discussed below should be understood as potential correlates and areas for further investigation, rather than established causes of low TKA achievement.



Internal Factors

1. Students' inability to answer higher-order thinking questions (HOTS)

TKA questions are designed not only to test memorization, but also reading, critical thinking, and inferential analysis skills. Many students still have difficulty answering questions that require higher order thinking skills (HOTS). Students' difficulties with higher-order thinking skills (HOTS) may be relevant to performance on assessments requiring analysis, evaluation, and problem-solving. Pamungkas et al. (2025) discussed limitations in students' engagement with higher-level cognitive processes, while Fitri and Abadi (2021) highlighted the importance of practising non-routine problem-solving strategies in classroom learning. These findings suggest that opportunities to develop analytical reasoning may be relevant to students' assessment readiness. However, the cited studies do not establish that limited HOTS directly causes low TKA scores. Assessment tasks involving contextual problems may place additional demands on students' reasoning and their ability to apply previously learned concepts. Research on mathematical literacy highlights the importance of interpreting and solving problems beyond routine procedures (Kappassova et al., 2025; Stacey & Turner, 2014).

2. Low Basic Literacy and Numeracy Skills

Basic literacy and numeracy are relevant competencies for interpreting information, understanding quantitative data, and solving contextual problems. Reflina (2023) discussed challenges associated with numeracy literacy, including difficulties in interpreting data and mathematical information. Limited reading comprehension may also make it more difficult for students to identify relevant information in lengthy question prompts. These findings suggest that literacy and numeracy warrant attention when examining students' readiness for reasoning-oriented assessments. However, their specific contribution to TKA performance cannot be established from the literature cited here alone.

Literacy and numeracy provide a foundation for interpreting information and applying concepts to unfamiliar problems. Students' difficulties in connecting basic concepts with new contexts may therefore be relevant to their performance on complex academic tasks. Research on literacy and numeracy supports the importance of these competencies in learning (Wahyuni & Himmah, 2024), although further evidence is needed to determine their relationship with TKA outcomes specifically.



3. The Effect of Academic Anxiety on TKA Achievement

Academic anxiety may be relevant to students' experiences of demanding assessments because it can be associated with concentration difficulties and perceived test pressure. Farrasia et al. (2023) discussed the potential relationship between anxiety and cognitive processes, while Daony et al. (2025) reported an association between academic anxiety and learning achievement. These findings suggest that anxiety warrants further examination in the context of TKA. However, its specific relationship with TKA performance cannot be confirmed without studies measuring both students' anxiety and their TKA outcomes.

4. Low Learning Motivation

Learning motivation may be associated with students' engagement, persistence, and willingness to practise challenging academic skills. Subekti and Kurniawan (2022) discussed the relationship between motivation and students' learning behaviours, while Lisnasari et al. (2025) provide further context for considering motivation in academic learning. These findings suggest that motivation may be relevant to students' preparation for assessments. Nevertheless, the relationship between learning motivation and TKA performance requires further investigation using evidence specific to TKA.

External Factors (Environment & System)

1. Gap between Classroom Learning and TKA Requirements

Alignment between classroom instruction and assessment requirements is an important consideration when examining students' learning opportunities. Ridha et al. (2025) discussed classroom learning conditions, while Fulmer and Polikoff (2014) examined issues related to instructional practices and assessment. If classroom activities provide limited opportunities to practise analytical reasoning and apply concepts across contexts, students may have fewer opportunities to develop these skills. However, the extent to which a gap between classroom instruction and TKA requirements exists must be established through direct evidence comparing teaching practices with TKA assessment demands. It should not be assumed solely from differences in students' scores.



2. The Phenomenon of Post-Pandemic Learning Loss

Current high school students are a generation that has gone through a period of transition to distance learning. Distance learning has an impact on students' cognitive, affective, and psychomotor aspects (Meilani et al., 2021). Distance learning during the pandemic has affected students' learning performance, including in the domains of mathematics and language, which are important foundations in the TKA (Cortés-Albornoz et al., 2023). Weak foundations in prerequisite subjects (such as basic mathematics or language logic) that occurred during the pandemic became a major obstacle when they had to take comprehensive tests such as the TKA (Wisenoecker et al., 2025).

3. Students' Socio-Economic Conditions

Students' access to additional learning resources, such as enrichment books, paid applications, and intensive courses, is influenced by their socio-economic background. Students from higher socio-economic backgrounds generally have greater parental support, better learning environments, and more access to private tutoring, which can support academic achievement (Sirin, 2005). In contrast, students from low-income families may face financial and time constraints that limit their participation in learning activities outside school. Socio-economic differences also affect access to digital resources, which has become increasingly important in technology-based learning (Van Deursen & Van Dijk, 2019). These differences can contribute to disparities in academic achievement between students from different socio-economic backgrounds (Yigiter, 2025; Reardon, 2011).

4. Lack of Simulation and Adaptation to the CAT System

Low achievement is often not due to a lack of knowledge, but rather a lack of technical readiness in managing time in the Computer Assisted Test (CAT) system. Many students get stuck on one difficult question for too long without paying attention to overall time management (Fu et al., 2025). Ineffective time allocation may increase cognitive load, reducing students' ability to process subsequent questions accurately despite having adequate subject knowledge (Paas & Van Merriënboer, 2020). Studies also indicate that students who lack prior experience with CAT environments are more prone to anxiety, which further impairs decision-making and pacing during tests (Putwain et al., 2019).



5. Pedagogical Competence and Teacher Readiness in Implementing HOTS-Based Learning

Teachers' pedagogical competence is also related to TKA achievement. Teachers have an important role in developing learning activities that promote reasoning and critical thinking. However, some teachers still face difficulties in implementing HOTS-based learning due to limited understanding, administrative demands, learning resources, and professional training (Agusta & Sa'dijah, 2021; Saraswati & Agustika, 2020). Teachers with stronger pedagogical content knowledge are more likely to develop students' higher-order thinking and problem-solving skills (Darling-Hammond et al., 2017). Conversely, limited use of HOTS-oriented teaching strategies may lead to learning that focuses more on memorization than analytical reasoning (Hattie, 2009).

6. Curriculum Implementation Gaps

Curriculum implementation is another external factor that may influence TKA achievement. Although the national curriculum emphasizes literacy, numeracy, and higher-order thinking skills (HOTS), its implementation in schools is not always consistent with these goals. Learning often remains focused on material coverage and routine problem solving, leaving students less familiar with contextual and reasoning-based questions such as those in the TKA (Soleman, 2020). The large amount of material to be covered may also limit opportunities for deeper learning and the development of students' analytical and evaluative skills (Soleman, 2020). This gap between curriculum goals and classroom practice may contribute to low TKA achievement (OECD, 2023).

CONCLUSIONS

This review identified ten factors that may be associated with academic achievement and TKA performance among Indonesian senior high school students, comprising four internal factors: difficulties in answering higher-order thinking skills (HOTS) questions, limited basic literacy and numeracy, academic anxiety, and low learning motivation; and six external factors: misalignment between classroom learning and TKA requirements, post-pandemic learning loss, socioeconomic conditions, limited simulation and familiarity with computer-based assessments, teachers' pedagogical competence and readiness to implement HOTS-oriented learning, and curriculum implementation gaps. National TKA scores in 2025 varied across subjects, with English recording the lowest mean score among the three compulsory



subjects, followed by Mathematics and Indonesian Language. These differences provide context for understanding students' academic competencies but do not establish the causes of variations in performance. As many studies examined general academic achievement or assessments other than TKA, the ten factors should be interpreted as potential associations rather than confirmed determinants of low TKA scores. Future research using TKA-specific data is needed to examine these relationships and identify appropriate educational improvements, while the effects of specific interventions on TKA outcomes remain to be evaluated.

DECLARATIONS

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The authors have no special acknowledgments to declare.

AI Usage Declaration

AI tools were used to assist with language editing and improving manuscript clarity. The authors reviewed and verified the content and take full responsibility for the final manuscript.

Author Contributions

KD contributed to conceptualization, literature search, data synthesis, and manuscript preparation. SC contributed to the literature review, interpretation of findings, and manuscript revision. Both authors reviewed and approved the final manuscript.

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Conflict of Interest

The authors declare that they have no conflicts of interest related to this study.

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