Volume: 5
Issue: 1 (January-February 2026)
Pages: 45–52
ISSN (Online): 3006-6646
DOI: 10.62843/jrsr/2026.5a166

JRSR
JOURNAL OF REGIONAL STUDIES REVIEW

Cite this Article: E-Rubab, U., Aslam, S., & Asghar, M. (2026). Promoting Higher-Order Thinking through Bloom's Taxonomy: A Review Study. *Journal of Regional Studies Review, 5*(1), 45-52. https://doi.org/10.62843/jrsr/2026.5a166

RESEARCH ARTICLE

JOURNAL OF REGIONAL STUDIES REVIEW (JRSR)

Promoting Higher-Order Thinking through Bloom's Taxonomy: A Review Study

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Abstract: Bloom's Taxonomy has been a fundamental framework for organizing learning goals and evaluating cognitive growth. With a specific focus on Pakistan, this review study looks at how Bloom's Taxonomy especially its updated version promotes Higher Order Thinking Skills in modern educational environments. The study examines the conceptual underpinnings of HOTS, their alignment with Bloom's Taxonomy's upper levels (analyzing, evaluating, and producing), and their importance in preparing students for the demands of the twenty-first century, drawing on both domestic and international literature. The study highlights instructors' perspectives, teaching methods, and evaluation techniques while synthesizing findings from other studies on the application of HOTS in diverse classroom environments. Additionally, it critically examines how Bloom's Taxonomy is used in Pakistani teacher education programs, curricula, and evaluation systems. The study highlights the main obstacles to promoting higher order thinking skills in Pakistan, such as a culture that prioritizes rote memorizing due to exams, a lack of teacher preparation, a lack of resources, and a poor alignment between policy and practice. The study emphasizes how important government policies and teacher professional development are in fostering higher-order cognitive abilities. It is concluded that although Bloom's Taxonomy provides a strong framework for improving critical and creative thinking, systemic changes in curriculum design, assessment procedures, and ongoing teacher training programs are necessary for its successful application in Pakistan.

Keywords: Bloom Taxonomy, Creative Thinking, Government Policies, Cognitive Abilities

Introduction

Bloom's Taxonomy, was first presented by Benjamin S. Bloom in 1956. In 2001, Anderson and Krathwohl made revisions to Bloom's Taxonomy. The cognitive domain included in the KKNI is based on this updated Bloom's Taxonomy (Palar, 2020). Bloom's Taxonomy divides thinking into three categories: Lower Order Thinking Skills (LOTS), Medium Order Thinking Skills (MOTS), and Higher Order Thinking Skills (HOTS) (Kristanto & Setiawan, 2020). Bloom's Taxonomy comprises six levels of cognitive abilities: C1 (remembering) and C2 (understanding) are classified under the LOTS thinking process, C3 (applying) is classified under the MOTS thinking process, and C4 (analyzing), C5 (evaluating), and C6 (creating) are classified under the HOTS thinking process. But there are other cognitive qualities that can be categorized into only two groups: HOTS and LOTS.

The new Bloom's taxonomy includes higher order thinking abilities (HOTS) as operational verbs that can be used to formulate questions. These verbs include analyzing (C4), evaluating (C5), and creating (C6) (Fanani, n.d.). It promotes the idea of a higher education curriculum, specifically the KKNI, which is focused on the competency of the student. The minimum requirements for evaluating student learning processes and outcomes in order to fulfill graduate learning achievement are emphasized by learning evaluation standards

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for higher education. These requirements include (a) evaluation principles; (b) evaluation techniques and instruments; (c) evaluation mechanisms and procedures; and (d) evaluation implementation. Evaluation methods include performance, participation, written and oral exams, surveys, and observation (Minister of Education and Culture of the Republic of Indonesia, 2020).

An instrument called a test is required to measure the learning outcomes of students. The test's primary goal is to evaluate each student's progress in their learning process. Furthermore, it seeks to gather precise data regarding the degree of success of students' learning objectives so that it can be investigated further (Daryanto, H .2012).

The cognitive, emotional, and psychomotor elements are all adequately measured. These three elements are crucial areas for assessment. Multiple choice is one of the alternative formats in which HOTS item questions can be created at the cognitive testing stage. HOTS-loaded questions typically employ a stimulus that alludes to an actual circumstance. Subject matter (stem) and answer choices (options) are included in multiple-choice questions. Distractions and the answer key must be included in the HOTS question response options. The right response can be found in the answer key. Even if a distractor is a wrong response, it can fool someone into selecting it if the lesson content needs to be better understood. In most cases, neither the reading nor the stimulus expressly states the desired response (answer key). Students are asked to use logic and reasoning, as well as their knowledge of ideas, to find solutions pertaining to the reading or stimuli. According to Widana (2017), the right response receives a score of 1, while the incorrect response receives a score of 0.

The ability to: 1) transfer concepts, 2) process and apply information, 3) identify connections from various types of information, 4) use information to solve problems, and 5) critically examine ideas and information are all typically measured by higher order thinking skills questions in the assessment context. But recall questions are more difficult than HOTS-based questions (Anani 2018).

Each student's higher-order thinking skills can be measured with clarity using the HOTS-loaded questions. Three elements are involved in assessing higher-order thinking, (1) giving students something to think about. In essence, it is in the structure of the first text or reading, visuals, scenarios, dialogues, or problems; (2) use new problems for students that have never been discussed in class, rather than just questions for the process recalled; and (3) compare the cognitive level (low-level thinking and high-level thinking) and difficulty level of the questions (easy, medium, or difficult) (Ahmad & Sukiman, 2019).

There are various methods of evaluating learning outcomes at the higher education level, such as extensive tests designed to gauge students' proficiency and comprehension of the subject matter. In general, pupils need to be proficient in three areas: cognitive, emotional, and psychomotor. The cognitive domains are assessed at the comprehensive test stage using Bloom's Taxonomy, specifically C1–C6 (memory, comprehension, application, analysis, synthesis, evaluation/creation in Anderson's revised taxonomy). From a theoretical standpoint, the validity and reliability of every measuring tool, including those employed in comprehensive exams, have not yet been established. The reason for this is because the idea of measurement has failed to provide the necessary skills in the pupils (Suwarna & Ilmi, 2016). The first comprehensive test was administered at the undergraduate level at IAKN Manado in 2022 in the Faculty of Theology, which also included Biblical and Systematical Majors. Taking the thesis test requires passing a rigorous exam. Multiple-choice questions make up the comprehensive exam format. The purpose of this study is to examine how Higher Order Thinking Skills (HOTS) questions are distributed using the updated Bloom Taxonomy.

Higher order thinking skills help students to interact with knowledge in a more thoughtful, analytical, and creative manner, the HOTS notion is important to the Taxonomy. The creation of HOTS enables students to go beyond simple memory, giving them the cognitive skills required to solve challenging issues and exercise critical thought in both academic and real-world contexts (Qasrawi & Abdelrehman, 2020). Fostering HOTS is now essential to preparing students for the difficulties of the twenty-first century, given the changing needs of the modern world (Anderson & Krathwohl, 2001).

Higher Order Thinking Skills (HOTS)

Sulaiman, et al., (2017) define higher order thinking skills as using the intellect extensively to create or discover something special. Higher order Thinking skills enable one to apply newly acquired knowledge in novel contexts to obtain possible solutions. The ability to think at a higher level as opposed to just memorizing facts and repeating them verbatim is known as high order thinking. In order to enable students to apply, analyze, evaluate, and think creatively, schools implemented Higher Order Thinking Skills (HOTS). The three components of HOTS are (1) transfer, (2) critical thinking, and (3) problem solving (Brookhart, 2010). According to Othman's (2014) review, are we clear about what our instructors are expected to perform in the classroom? This leads to the current issue, which is whether or not teachers are able to develop students who can think critically and creatively both in the classroom and in real-life settings. The emergence of the Information Age has made the development of critical thinking, problem-solving, and higher-order thinking skills essential to success in the future (Adawati 2014).

The highest levels of the updated Bloom's taxonomy are analyzing (C4), evaluating (C5), and producing (C6) are included in Higher Order Thinking Skills (HOTS). According to (Yusuf et al., 2018; Agussuryani et al., 2022), these levels are regarded as HOTS since they entail complicated cognitive processes such as discriminating, organizing, attributing, making judgments based on criteria, and producing new patterns or structures. The updated taxonomy places more emphasis on higher-level thinking, which calls for metacognitive processes and mastery of prior knowledge levels (Febrina, 2019). During the learning process, students' proficiency in the lower-order cognitive domains, C1 to C3, determines their capacity for higher-order thinking.

Blooms's Taxonomy with the Educational Context of Pakistan

In "Analysis Based On Bloom's Taxonomy: Pakistan's Federal English Curriculum and Examination Content For Matric," Hassan (2023) examines how the goals of the English curriculum in Matric match with the substance of the annual exam, or the Board Exams in Pakistan. In order to contribute to an enhanced, dependable, and valid English language assessment, the researcher concentrated on addressing the significance of English language assessment within the Matric system as well as evaluating discrepancies between the English assessment objectives and the test content. The study made a case for all relevant stakeholders, including test developers, users, and educational researchers in Pakistan, to concentrate on implementing higher levels of Bloom's taxonomy.

In 2021, Husain, Faize, and Faize carried out a study. The quality of education in the Pakistani environment is evaluated using Bloom's Taxonomy. They maintained that the ideal goals outlined in educational policy had never been evaluated in the context of Pakistan. Nearly 1500 students of middle, secondary, and upper secondary education, including both genders, from Play Group to Class 12, participated in interviews, tests, and focus groups. The study supported the idea that Pakistan has not met the educational goals outlined in Bloom's taxonomy for satisfactory results. By including ideal educational objectives, the researchers focused on improving the quality of education in Pakistan.

In "Bloom's Taxonomy and Prospective Teachers' Preparation in Pakistan," Amin et al. (2024) examined how prospective teachers in Pakistan were prepared using Bloom's Taxonomy. According to the study, male prospective teachers in Pakistan are more likely to excel at HOTS, or high-level skills in Bloom's taxonomy, such as critical and analytical skills (analyzing and evaluating), while female prospective teachers are much more likely to demonstrate mastery of LOTS, or low-level skills, as defined by Bloom's taxonomy, such as remembering and understanding. Additionally, the study discovered that freshmen students performed better at the lower levels of Bloom's Taxonomy than students in later years of their studies.

As a direct result of the national examination system, which primarily promotes recollection over cognitive depth, Hussain and Munir (2015) point out that Pakistani students frequently concentrate on remembering textbooks without completely comprehending or digesting the content. This problem is made

worse in rural areas, where there are fewer resources and qualified teachers, which puts pupils from different areas on an unequal playing field.

According to a study by Shams and Rashid (2019), there has been little success in integrating HOTS into the curricula and teaching methods, despite the National Education Policy (2009) advocating for a change toward a more skill-based educational system. A systematic resistance to change has resulted from a dearth of professional development programs and teacher training that promote critical thinking abilities. Even though some private schools have started implementing more modern teaching techniques, the overall effect has been little.

Impediments to Fostering Higher-Order Thinking Skills in Pakistan

There are several factors that make it difficult to successfully use Bloom's Taxonomy, especially when it comes to HOTS. The overwhelming reliance on tests that assess factual knowledge rather than higher cognitive abilities is one of the main obstacles. Pakistan's test system usually places a strong emphasis on memorizing, leaving little opportunity to assess pupils' application or analysis skills. Consequently, the emphasis is still on LOTS, which is in direct opposition to the necessity of creating HOTS. Additionally, preparation and training for teachers are major challenges. Many teachers still use antiquated teaching techniques that do not promote critical engagement with the material, and the curriculum itself offers no guidance on how to teach HOTS (Alim & Farooq, 2014). Many teachers are not exposed to contemporary teaching techniques that encourage higher-order thinking, like project-based learning, inquiry-based learning, and collaborative learning.

Another important consideration is the availability of resources. Schools in many sections of Pakistan, particularly in rural areas, suffer from crammed classrooms, a lack of instructional resources, and restricted access to technology. These circumstances make it challenging to put into practice the kinds of instructional techniques like technology integration, interactive courses, or research-based projects that are necessary to promote HOTS (Zafar, 2017).

Professional Training and Development of Teachers

One of the main factors that can encourage the use of HOTS in the classroom and the adoption of Bloom's Taxonomy is teacher training. Hussain and Munir (2015) claim that rather than emphasizing instructional techniques that improve cognitive abilities, teacher professional development in Pakistan frequently concentrates on topic knowledge. Because of this, educators are frequently ill-equipped to employ higher-order thinking techniques in their instruction. Teachers must adopt a new perspective on their position in the classroom in order to be trained to go beyond memorization. In addition to improving material understanding, professional development programs ought to give educators the tools they need to support inquiry-based learning, critical thinking, and cooperative problem-solving. In order to encourage students to interact with the material at a deeper, more introspective level, teachers must be taught to create lesson plans that guide students through the various cognitive levels listed in Bloom's Taxonomy.

The Role of Government Policies in Promoting Higher Order Thinking Skills (HOTS)

The National Education Policy of Pakistan (2009) emphasizes the significance of a transition to a skill-based educational system, acknowledging the necessity of giving pupils the cognitive and creative abilities necessary for success in the contemporary world. Nevertheless, the policy's practical implementation in schools has been sluggish, despite its emphasis on HOTS. The mismatch between local educational practices and national policies is one of the main causes of this delay. Specific government-level initiatives must be taken in tandem with the policy suggestions that seek to include HOTS into the curriculum. This entails creating evaluation methods that take these cognitive levels into account and updating the national curriculum to place a greater emphasis on critical thinking and problem-solving abilities. Additionally, the government needs to fund professional development and teacher training initiatives that focus on properly teaching HOTS. Curriculum

designers should also interact with foreign specialists to make sure that a more comprehensive approach to education is incorporated into Pakistan's educational structure.

International Studies on the Application of Higher-Order Thinking Skills

A case study by Kusumastuti, I, et al., (2019) exposed the presumptions made by high school English teachers on HOTS in reading assignments. They selected a public-school teacher who had taken higher order thinking skills courses, whereas the other private sector instructor who didn't take any classes. The private school instructor has only six months of experience, while the public-school teacher has fifteen years. In general, both educators concurred that students could effectively communicate the newly acquired knowledge in a novel situation. However, their perspectives on using critical thinking differed. The teachers reported that there are difficulties in conducting HOTS due to student-centered classroom which is not effective. Students still choose teacher-centered learning to guide them. The researchers concluded that students' lack of vocabulary knowledge generates disagreement between teachers' views and how they are planned for in the classroom.

According to Ansori, M, et al., (2019) higher order thinking skills are very effective to teach reading and how that might manifest in the classroom. There are many factors influenced on teachers' beliefs, and many so. Teachers' presumptions regarding the idea and significance of HOTS are very important techniques for group projects, questioning and games techniques that encourage higher order thinking skills for performing crucial role in classroom practices.

According to Yulia, Y, et al., (2019), asking questions helps pupils develop their critical thinking abilities. Students gave hesitant responses to the teacher's questions, which increase the involvement of pupils in the classroom. Their level of English language competency improved as they responded and engaged more. During classroom engagement, the teacher used Bloom's classification to ask a variety of questions based on data collected. However, because teachers were employing a lower level of thinking skills in their lesson, the result was unsatisfactory. Students' critical thinking and inventiveness were impacted. They eventually lost interest in honing their linguistic abilities, which led to a lack of proficiency with the second language. By the conclusion of the study, the researchers recommended that educators increase their exposure to language.

The application of lower order thinking and higher order thinking skills in early school learning are playing an essential role as resources used to lead the class Kuniawan , A (2018). These resources that instructor used to lead the class. The instructor utilized a textbook-based instruction sheet with basic discussion reading material. The instructor was not employing HOTS sequentially, the researcher observed. Due to the lack of appropriate guidelines, he frequently mixes up the six levels as he pleases. According to the researcher's observations, the instructor began the session by using creative talents, which may have confused the students. In a different instance, the instructor made no use of assessment techniques.

Conclusion

With a focus on the educational setting of Pakistan, this review study investigated the value of Bloom's Taxonomy as a thorough framework for fostering Higher Order Thinking Skills (HOTS) in modern education. The revised Bloom's Taxonomy, particularly its higher cognitive levels of analyzing, evaluating, and creating, offers a solid theoretical and practical basis for encouraging critical thinking, problem-solving, and creativity in students, according to an analysis of national and international literature. Effective HOTS implementation improves students' capacity to apply information in new contexts, participate in deeper learning, and meet the intellectual demands of the twenty-first century, according to the reviewed studies. Despite its acknowledged benefits, the research shows that Bloom's Taxonomy is still only partially and unevenly applied in Pakistan. Major obstacles to the development of HOTS include an examination-oriented culture that emphasizes rote memory, inadequate teacher preparation, a lack of instructional resources, and a lack of alignment between curriculum, assessment, and policy. The implementation of national education policy has

been sluggish and dispersed, especially in public and rural educational institutions, despite its emphasis on a move toward skill-based learning. Because of this, classroom procedures and evaluation methods still heavily rely on lower-order cognitive abilities. The results of this review highlight how important it is for educators to convert Bloom's Taxonomy into useful teaching strategies. Sustainable change requires ongoing professional development with an emphasis on teaching techniques and evaluation techniques that promote higher-order thinking. Furthermore, government activities need to go beyond the creation of policies and instead focus on practical measures like curriculum reform, assessment redesign, and funding for teacher preparation and educational materials. To sum up, Bloom's Taxonomy is still a strong and applicable framework for raising educational standards and fostering higher-order cognitive abilities. However, systematic and coordinated changes at the institutional, policy, and educational levels are necessary for its successful implementation in Pakistan. By empirically examining the effects of HOTS-based instruction and assessment across various educational levels and geographical areas, future research may expand on this evaluation and support evidence-based reforms in Pakistan's educational system.

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