



RECONCEPTUALIZATION THE COGNITIVE DOMAIN OF THE BLOOM'S TAXONOMY FOR ENGLISH LANGUAGE EDUCATION: A CONCEPTUAL FRAMEWORK IN THE ERA OF GENERATIVE AI

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Abstract

Bloom's taxonomy framework serves the purpose of delivering instructional design and curriculum transaction effectively from lower to higher level of students. With the advent of generative Artificial Intelligence, the Bloom's Taxonomy needs to revive the psychological constructs resulting to the functional autonomy of learners in existing pedagogical framework. Employing a conceptual framework development methodology, the study critically examines the urgent need to refurbish the cognitive domain of Bloom's taxonomy to include the Gen-AI tools and techniques to make it more comprehensive and time relevant. Special attention is given to enhance the higher order cognitive skills while building strong foundation in lower order cognitive structure. Previous relevant studies showed scarcity of sources which specially address the need of reconstructing Bloom's Taxonomy in English Language Education. Hence, this research study explicitly focuses on how AI-inclusion in Bloom's taxonomy changed the notion of developing higher order knowledge in English language acquisition. This tentative theoretical framework proposes and suggests the policy holders and educators to consider the existing pedagogical framework with revised AI-infused Bloom's taxonomy in English language education.

Keywords: Bloom's Taxonomy, Cognitive Domain, English Language Education, Revised AI-mediated taxonomy, Conceptual Framework Development

Introduction: Bloom's taxonomy has been a seminal work in the field of education which distinctly allocated the educational objectives according to the cognitive, affective and psychomotor constructs in harnessing learner's behavioral aspects. With its introduction in

1956, it has served as a foundational framework for setting instructional design in classroom settings. The taxonomy provides a structured emphasis to classify the behavior goals of the learners pertaining to the cognitive complexity of the students, supporting curriculum design and transaction, pedagogical approaches and assessment practices globally (AlAfnan & AI, 2024). Krathwohl and Anderson revised the original taxonomy focusing towards action in 2001, which further extended into Digital Bloom's Taxonomy (Church, 2010) which was highly relevant for incorporating digital tools and web 2.0 technologies into traditional framework which was highly susceptible for the demand of early 21st century. The sudden insurgence of generative artificial intelligence fundamentally changed the overall educational diction. The advanced algorithmic tools are not mere assistive rather capable of supporting like individual entity with its machine intelligence. Tools like ChatGPT, Gemini, Claude and other several AI-powered platforms are capable of generating human-like outcome, initiating conversation, helping in writing, summarizing, analyzing or creating original content. The technological upheaval has mandated an urgent need to recalibrate the existing cognitive framework. Several research studies critically argued the fact that the traditional even the digital bloom's taxonomy is insufficient to serve the complexities of AI-mediated learning environment (Panthalookaran, 2025; Hmoud & Ali, 2024; Eideh, 2026). In English language education AI can support in greater extent while writing, vocabulary building or other critical linguistic tasks (Alherabi & Aljebreen, 2025). The concern remains higher when students are prone to over-reliance on AI outputs, that limits their critical and creative thinking being oblivious to the fact that how it can hamper their authenticity and ethicality (Asbari, 2025; Chan & Wong, 2025). English language education particularly demands higher order cognitive skills like critical thinking, creative writing and evaluative judgment of any literary text or rhetorical devices. Observing the existing gap between the intended aspiration of AI inclusion in the English language education and the ethical issues pervading, the need to build a strong and solid pedagogical foundation becomes crucial. Several research studies mostly attempted to align AI-driven learning focus with Bloom's taxonomy, but either it's too general or centric to higher level educational need (Nehru et al., 2025; Hui, 2025; Khokhar, 2025). Analyzing the noticeable gap in addressing the rising cognitive demand of reconstructing Bloom's taxonomy in English language education in the age of AI-embedded learning scenario, the present study conceptualizes the limitation of existing digital

bloom's taxonomy and proposed to develop a concrete framework that includes the utility and feasibility of AI tools solidifying the existing Bloom's framework.

Research Objectives: The primary objectives of this research study are

- I. To critically examine digital Bloom's Taxonomy and its limitation in the Gen-AI for English language education
- II. To develop a conceptual framework which possible generative AI-affordance in Digital Bloom's Taxonomy

Methodology of the study: This research study adopts conceptual modeling framework to meet the objectives of the study. This methodological approach involves iterative analysis of theoretical presumptions where researchers extract the core constructs of Bloom's Taxonomy and its digital relevance in AI-mediated learning Environment. The process follows four iterative stages including

- I. Mapping the existing Bloom's Taxonomy Framework specific to cognitive domain
- II. Identify the gaps in English language classroom and possible AI incorporation
- III. Theoretical synthesis (Bloom's taxonomy+ AI intervention+ English language classroom)
- IV. Framework validation through logical coherence and relevance

Findings: The researchers in the theoretical analysis explicitly tried to meet the outcome according to the objectives set for the studies. The study critically examines each of the findings from the secondary sources and develops a conceptual framework for reinterpreting the AI-embedded revised Bloom's Taxonomy.

Objective I: To critically examine digital Bloom's Taxonomy and its limitation in the Gen-AI for English language education

Bloom's taxonomy (1956) has been influential in underpinning many of the instructional design, curricular standardization and behavioral modification in classroom setting worldwide. There are three distinct domains of cognitive, affective and psychomotor which effectively curate learner's holistic development (Ornell, 2006). This research study entirely focuses on the cognitive domain which comprises of six distinct functional constituents including knowledge, comprehension, application, analysis, synthesize that denote particular level specific learning outcomes. The classification of the taxonomy faced an abrupt change when Anderson, a former student's of Bloom with Krathwohl focused on the three major areas of taxonomy i.e., terminology, structure and emphasis in the task based approaches.

Anderson and kerathwohl introduced two dimensions of knowledge and cognitive processes. They changed cognitive process dimension from simple to complex i.e., remembering, understanding, applying, analyzing, evaluating and creating (Darwajeh, 2018). The modification has been illustrated below:

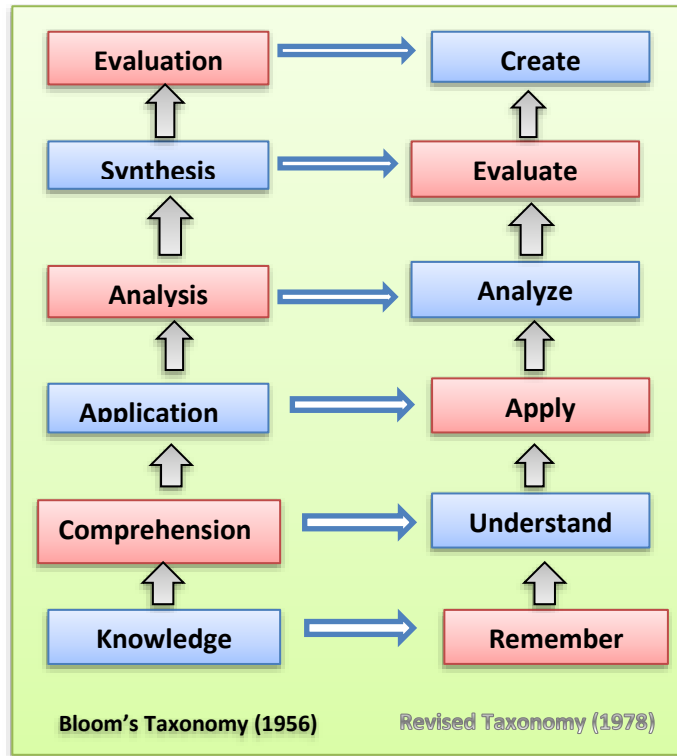


Figure 1: Original & Revised Bloom's taxonomy

This research study specifically focuses on the language learning education, where several studies have given insight on how Bloom's instructional objectives can be implemented on critical, reading, writing and evaluating textbook and learning outcome effectively (Tayyeh & Mohammad, 2021; Bayaydah., & Altwessi, 2020, Köksal & Ulum, 2018). The researchers in this study have classified and differentiated the language learning tasks associated with each cognitive level mentioned below:

Table 1: English Language skills associated with each cognitive level

Levels of Cognitive Domain	Description	Skills specific to English Language Acquisition
Create	Producing novel and original work	Writing an original novel, short story, poem, drama scripts
Evaluate	Critiquing, evaluating and justifying	Evaluating and critiquing literary piece, themes, plots, theories

	knowledge	
Analyze	Breaking down existing information to get the meta-information	Comparing characters, plots, themes of two different texts, analysing the literary devices, inner tone of a literary piece
Apply	Using knowledge to different context	Applying grammatical rules in writing any literary text, using learned words to another context
Understand	Explaining ideas and concepts	Summarizing particular poems or prose, any text, explaining meaning of idioms
Remember	Recalling facts and basic concepts	Memorizing grammatical rules, vocabulary, answers related to particular poems or prose, identifying part of speech in a text, reciting poems

In the early 21st century the digital technological tools started to amplify it's emphasize in almost every sectors including education. Technological elucidation also somehow modified the learner's intended behavioral goal at the same time changing the tasks and sub-goal associated with each domain. The intended learning outcome of English language education also get transformed to keep pace with the emergence of Digital Humanity where literary practice and communication becomes totally embedded in digital environment. The researchers in this study critically examined the Digital Bloom's taxonomy (Church, 2010), that reveals how the refined framework successfully imbibed the digital tools and verbs associated with web 2.0 technology, it duly exhibits significant limitation in incorporating Gen AI related complexities in setting the learning objectives. The proposed framework fundamentally developed to include the early digital technologies like blogging, wikis and basic multimedia creation that support learner's individual digital learning consumption and production in education (Amin & Mirza, 2020; Skiba, 2013)

Table 2: Table illustrating Digital action verbs mentioned in Revised Bloom's taxonomy

Cognitive Levels	Digital verbs & actions
Create	Design, Produce, podcast creating, video editing, programming, blogging, video-casting

Evaluate	Critiquing, Reviewing , Moderating, Remixing, commenting, collaborating
Analyze	Compare, Organize, Link, Mind-map, Mashing-up
Apply	Uploading, Editing, Simulating, Executing, Running, Operating
Understand	Summarizing, Annotation, Explaining, , categorizing files, tagging
Remember	Searching, Bookmarking, Highlighting, Retrieve, Bookmark,

The emerging inculcation of artificial intelligence has initiated a paradigm shift in educational domain characterized by human-AI collaboration, dynamic content generation and instant personalized feedback. This shift clearly outlines that digital Bloom's taxonomy has started to become an obsolete phenomenon. The major limitation of the existing digital framework lies in the lower-order cognitive levels (Remembering, Understanding). Church's model of digital taxonomy primarily focuses on passive searching of resources and summarizing the extract using digital tools. In contrast, Gen AI tools can function like autonomous entity through generating summaries, explanations, vocabulary lists, making traditional digital tasks outdated and archaic (AlAfnan & Al, 2024; Alherabi & Aljebreen, 2025). Learners and students now put emphasis on developing language skills rather taking extraneous and intrinsic cognitive load. At the higher cognitive levels (Analysis, Evaluate and create) the limitations of the digital taxonomy seems to be more profound. The existing digital framework does not necessarily recognizes the learner's contemporary proficiency skills like critical AI literacy such as hallucination that AI creates in providing information, assessing and evaluating biases and authenticities and engaging meaningful interaction with learner as co-creators of knowledge (Chan & Wong, 2025; Asbari, 2025; Panthaloorkan, 2025). While the digital framework focuses on creating independent digital content, the AI-mediated taxonomy offers new form of creativity like prompt crafting, iterative output refinement and ethical AI integration (Eideh, 2026; Hmoud & Ali, 2024). Moreover, the taxonomy significantly lacks emphasis on metacognitive and ethical AI consideration that is essential in language learning. The digital Bloom's taxonomy is also oblivious to the current educational issues like academic integrity, over-reliance of AI of learners and developing them in autonomous learning agent (Nehru et al., 2025; Hui, 2025). The digital Bloom's

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taxonomy bridges the traditional and digital instructional objectives, it lacks considering for the transformative and disruptive natures of generative AI. The theoretical analysis clearly shows the need for reconceptualized constructive framework that includes AI-specific cognitive procedures, critical evaluation skills and human-AI collaborative competencies specifically personalized for English language education.

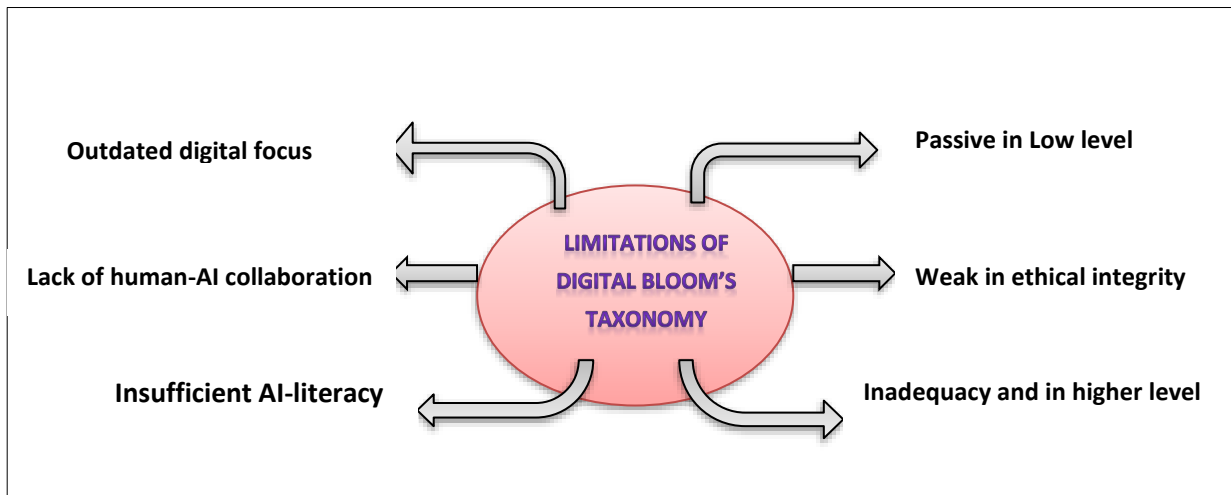
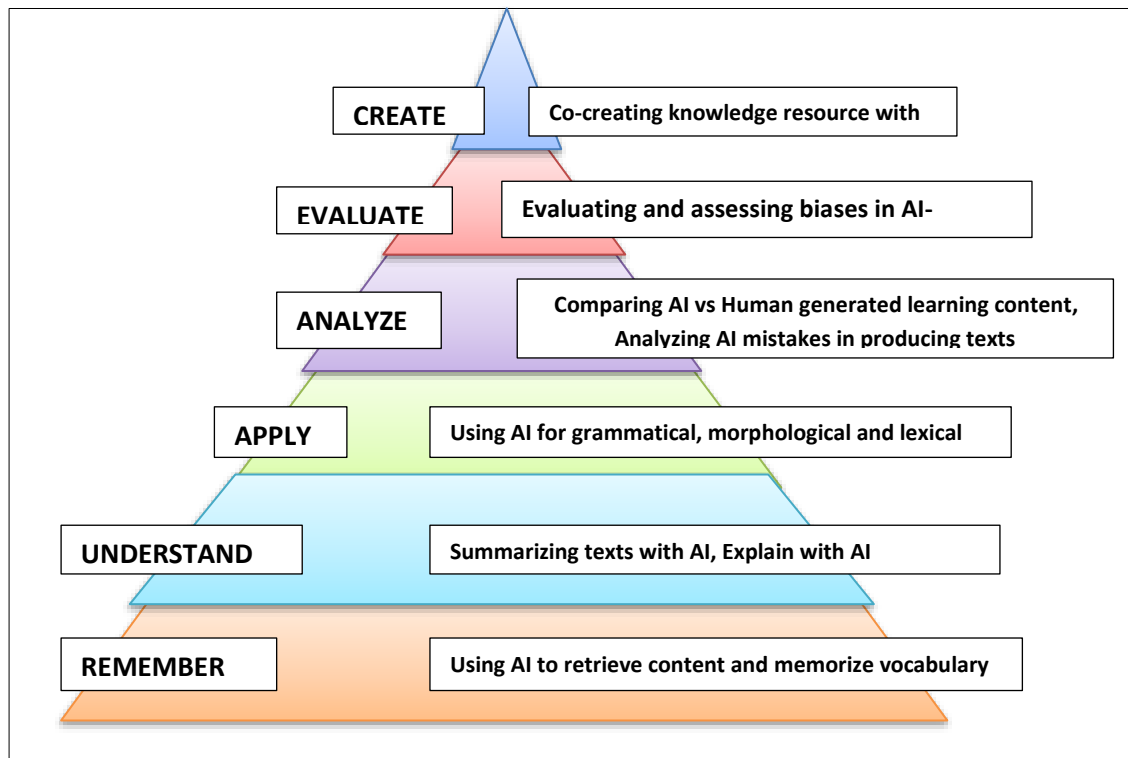


Figure 2: Limitations of Digital Bloom's Taxonomy addressing AI-intervention

Objective II: To develop a conceptual framework which possible generative AI-affordance in Digital Bloom's Taxonomy

After examining the key limitations included in the digital taxonomy framework (Churches, 2010), this study tried to build an advance taxonomical framework that predominantly focuses on the AI-infusion in English language education. The tentative framework duly underscores the exponential utility of generative AI which is mostly absent in the existing framework. The salient features of generative AI including content creation, morphological and lexical analysis, semantic or sentiment analysis, real-time conversation and appropriate human-AI collaboration in designing instructional objectives recapitulate the six cognitive domains to modern era of AI-automation. The existing framework was developed in the insurgence of web 2.0 technology while the proposed framework is substantially developed based on the iterative conceptual analysis based on the scholarly insights of the recent held studies focusing on the optimal impact of gen AI in stimulating instructional objectives.



The framework reevaluates each level of cognitive domain by incorporating the exclusive capabilities of generative AI while maintaining the possibilities of human cognitive contribution. While for the instance, the creating level focuses on the changing shifts from independent digital production to sophisticated human-AI co-creation ecosystem fosters through advanced prompting (Eideh, 2026), the analysis and evaluation level include competencies like detecting AI biases and ethically judging AI input and implications (Chan & Wong, 2025; Asbari, 2025). This suggested tentative framework accentuates on metacognition, ethical awareness and AI collaborative skills (Hui, 2025; Khokhar, 2025). This framework does not supposedly replace human cognitive aspects rather place AI as cognitive-constructive learning reinforcement that optimizes the futuristic instructional design. This research study also proposes to reframe the cognitive tasks and objectives associated with English Language education that is mentioned below

Table 3: AI-mediation in revised Bloom's taxonomy for English Language Education

Levels of cognitive domains	AI-mediated verbs & Activities in existing taxonomy	Examples of using in English language acquisition	AI-integration ideas in English language Lesson plans
Create	Co-create, generate, synthesis, remix content	AI-led brainstorming in human writing for original literary piece	Crafting tasks to write short-story to use AI as creative collaborator
Evaluate	Judge, Assess, critique the reliability and validity AI-output	Evaluating quality and biases in AI-based content, resources	Lesson Plan on reviewing and evaluating AI-generated content and resources
Analyze	Compare AI-outputs, detect AI-hallucination and deconstruction of AI-led text	Comparing human and AI literary writing piece	Analyze AI-generated versus student written text to identify strength and weakness
Apply	Implement AI tools in language analysis, crafting prompts, initiate conversation as role-play mediator	Using AI for grammar and speech correction and conversational practice	Assigning tasks to initiate conversation with AI-chatbots, using AI to linguistic analysis
Understand	Summarize the AI-led resources, paraphrase and interpret	Define and contextualize complex AI generated texts, assessment, practices	Using AI to redefine, understand and interpret in given texts
Remember	Prompt effectively, Retrieve AI content, curate the text	Use AI to recall vocabulary, poems, texts, extract new information	Vocabulary building lessons to generate and retrieve new words using AI tools,

Discussion

The research study recapitulates the cognitive domain of the Bloom's taxonomy by integrating generative AI's utilitarian approach for English language education. It explicitly showed though Churches' Digital bloom's taxonomy effectively mentioned the need of web 2.0 tools, it becomes inadequate in the current context of generative AI due to limited focus on human-AI collaboration, critical AI awareness and ethical neutrality (Alafnan & Al, 2024; Panthaloakaran, 2025). A key contribution of this study is to shift focus from technology assisted learning to human-AI intelligent collaboration. The proposed framework

shifts focus from rigorous hierarchy into a dynamic, interactive model suitable for AI-integrated learning environment. English teachers can use this taxonomy to design equitable and proportionate English lesson plan design that merges with AI-efficiency with cognitive architecture. It provides curriculum developers, policy makers and teacher educators to impose structured approach of AI-integration. The research paper though being conceptual in nature, offers time relevant and practical foundation for English Language teaching in the age of AI-automation.

Suggestions & Recommendations

The proposed AI-mediated revised Bloom's taxonomy framework offers concrete foundation for English language education. Future teachers and educators are suggested to consistently move beyond conventional task-based teaching learning towards human-AI based collaborative learning experience. As discussed in the analysis, the lower and higher cognitive domain can be supported by the specialist features of gen AI including vocabulary building, text-summarizer, semantic, morphological and lexical analyzer etc. The educators and the students should emphasize on gaining proficiency in the critical AI-awareness, skill in prompt engineering and ethical AI-usage. The suggested framework can be the foundational stone for the educators to plan instructional design in English language classroom according to the modern need of classroom for the new-age learners. The researchers in future might do experimental study incorporating AI in existing Bloom's taxonomy in English language or other subjects to validate the effectiveness of the proposed framework.

Based on the finding of the conceptual investigation following recommendations are referred

- The modern curriculum developers should revitalize the existing English language curriculum to deliberately include functional AI components and update with the proposed curricular framework
- Teacher Training institutes should introduce training module which inculcates AI-integrated pedagogical strategies based on this framework in pre-service and in-service teachers.
- Educational policymakers should consider the suggestive framework to mandate strict AI-led human ethics, data privacy and equitable access for English Language education.

Conclusion

The study has reinterpreted the cognitive domain of the Bloom's taxonomy considering the enormous scopes and disruptions brought by Generative AI in English language Education. The study comprehensively found the limitations infused in the traditional framework and has tried to propose the AI-mediated revised Bloom's taxonomy with the affordance of advanced AI tools that aims to revolutionize existing conventional English Language Learning towards contemporary pertinence. The study underscores the accelerating need for modern English language educators and learners to shift towards preparing learners to think, apprehend and create divergently while collaborating artificial intelligence astutely. The reconfiguration provides a practical and conceptual understanding for curating AI-powered to facilitate both linguistic proficiency and 21st century augmented cognitive capabilities. Conclusively it can be inferred that teachers' and stakeholders' readiness, open and equitable access to strategic usage of advanced AI tools and clear focus on human cognitive enhancement. With the rapid evolution of Gen AI into educational field, this revised framework provides a plausible and flexible guide for modernizing and transforming English language for the successive years.

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