Reframing Bloom's Taxonomy

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Bloom's Taxonomy has long been a cornerstone in educational design and practice. However, its traditional pyramid representation and application often lead to misconceptions about the learning process. This paper presents a reframing of Bloom's Taxonomy as a waterfall, grounded in constructionist learning theory (Papert & Harel, 1991), to address these issues and promote more effective learning design. Bloom's Taxonomy was first published in 1956 in the book Taxonomy of Educational Objectives (Bloom, 1956). The revised version of Bloom's Taxonomy commonly used today was published in 2021 (Anderson & Krathwohl, 2001). There have been critiques of Bloom's Taxonomy (e.g., Crawford & Smith, 2015; Murtonen et al., 2017; Wineburg & Schneider, 2011) arguing that the pyramid shape used is problematic.

The Waterfall Model: A New Perspective

The waterfall model of Bloom's Taxonomy (see Figure 1) challenges the conventional bottom-up approach. Instead of viewing the taxonomy as a hierarchy to be climbed, we propose a top-down flow where higher-order thinking skills cascade into and enrich lower-order skills. This new model places 'Create' at the top, emphasizing its primacy in the learning process. It presents skills as interconnected, with higher-order skills naturally encompassing lower-order ones. The waterfall visualization also clearly demonstrates the decreasing impact and persistence of learning outcomes as we move down the cascade.

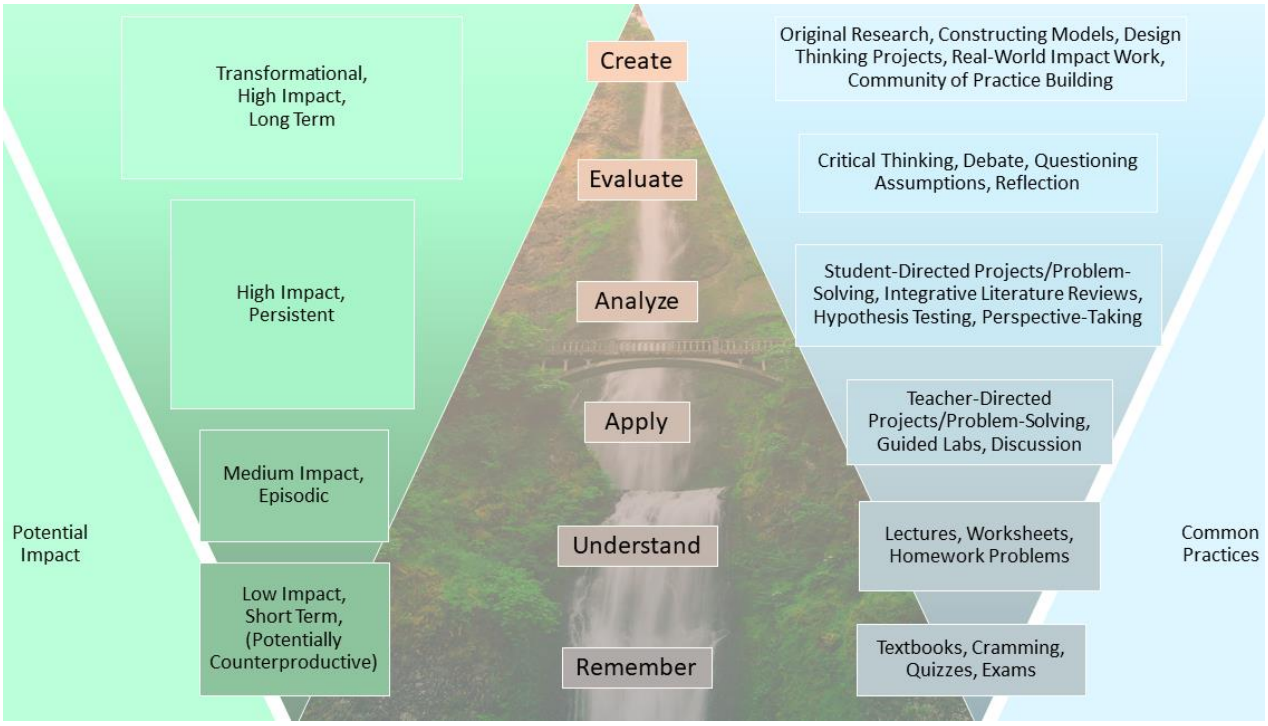

Figure 1. The Waterfall Model of Bloom's Taxonomy

Constructionist Learning Theory: The Foundation

This reframing is deeply rooted in constructionist learning theory (Papert & Harel, 1991), which argues that the most powerful learning occurs when learners actively construct external artifacts as "tools to think with." This approach naturally aligns with the higher levels of Bloom's Taxonomy, encouraging learners to engage in creation, evaluation, and analysis from the outset of their learning journey.

Implications for Learning Design

The waterfall model suggests that learning experiences should be designed to engage learners immediately in creation, evaluation, and analysis. By focusing on these higher-order objectives, lower-order skills are naturally developed in context, eliminating the need for isolated practice of basic recall or comprehension. Consequently, learning designers should avoid creating objectives that target only the bottom two or three levels of the taxonomy. Instead, they should strive to create rich, complex learning environments that challenge learners to operate at the highest cognitive levels.

Practical Applications

In practice, this approach favors project-based learning that emphasizes real-world projects requiring creation and evaluation. It encourages the use of problem-solving scenarios that present complex challenges necessitating analysis and synthesis. Collaborative knowledge construction becomes a key strategy, with learners working together to create and evaluate ideas. These methods not only engage higher-order thinking skills but also naturally incorporate lower-order skills in meaningful contexts.

Challenges and Considerations

Implementing this new approach is not without challenges. It requires a significant shift in thinking for many educators and institutions accustomed to traditional, bottom-up approaches to learning. Assessment methods may need to be reconsidered to align with this model, moving away from simple recall tests to more complex, performance-based evaluations. Additionally, while the model advocates starting at the top of the taxonomy, it's crucial to provide appropriate support and scaffolding for learners to engage successfully with higher-order tasks. Educators must be prepared to guide learners through the complexities of creation and evaluation while ensuring they develop a solid understanding of fundamental concepts.

Conclusion

By reframing Bloom's Taxonomy as a constructionist waterfall, we open new possibilities for learning design that are more aligned with how people naturally learn and develop cognitive skills. This model encourages educators to prioritize transformative, high-impact learning experiences that engage learners in creation, evaluation, and analysis from the outset. While it presents challenges to traditional educational paradigms, it offers a path to more meaningful, enduring learning outcomes. As we continue to evolve our understanding of effective learning, this reframed taxonomy provides a valuable tool for creating educational experiences that truly empower learners to think critically, create innovatively, and engage deeply with their world.

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