



SHELL
EDUCATION

HIGHER-ORDER *Thinking* SKILLS

to Develop
21st Century
Learners

Wendy Conklin

Foreword by
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Foreword

For those who have recognized the importance of teaching higher-order thinking skills, Wendy Conklin's book *Higher-Order Thinking Skills to Develop 21st Century Learners* will come as a welcome resource. Her summaries and documentation of those thinkers who have offered various approaches to thinking skills add the necessary depth to this book. Her inclusion of broad instructional models as well as specific classroom strategies brings the theory into practical application for the classroom.

Why bother with higher-order thinking skills? Tests (especially standardized tests) just ask for facts.

These days, more and more employment opportunities are requiring people who can think adroitly—and often think on their feet. In no way am I suggesting that learning facts is out of date. Rather, I am suggesting that facts and data alone will not cut it in our 21st century. This is not only because front-line workers are called upon to make critical judgments, but also because the data and information is constantly changing, evolving, and being updated. The task of evaluating new information is never-ending. For decades, we have heard the phrase “life-long learners.” The necessity for this is truer than ever in this 21st century.

Relative to this question regarding the importance of higher-order thinking skills, be sure to read the section titled “The Necessity of Higher-Order Thinking Skills.” In it, Conklin cites Stanley Pogrow's research using higher-order thinking skills with educationally disadvantaged students. The emphasis on these skills alone substantially increased the performance of those students in a variety of standardized tests. In addition, even standardized tests are moving to include material requiring facility in higher-order thinking skills.

In [Chapter 2](#), Conklin analyzes the essential qualities of the 21st century thinker: asking questions, thinking strategically, using logical reasoning, exercising metacognition, and communicating effectively. While the 21st century thinker indeed needs to be familiar with facts, thinking needs to go beyond knowing the facts to being able to manipulate, evaluate, and apply them—all a part of the essential qualities of the 21st century thinker.

There are other materials on higher-order thinking skills. Why use this book?

This book is an up-to-date, comprehensive primer on the subject of higher-order thinking skills. As the title suggests, this is a book geared toward teaching and learning in the 21st century. For those who are intrigued with higher-order thinking skills but feel weak in the grasp of ongoing thinking in that field, Conklin gives important theoretical background. While making references to many of the higher-order thinking theoreticians of the previous century—such as John Dewey, Edward De Bono, Stanley Pogrow, and Richard Paul—Conklin goes into helpful detail with the updated model for Bloom's Taxonomy, Frank Williams' Taxonomy, and the Wallas Model.

For those who question when to begin working with students on these skills, Conklin provides a chapter on cognitive development. For those wondering what curriculum areas will be conducive to higher-order thinking skills, Conklin's chapter on platforms for

higher-order thinking will be invaluable. For those wondering what various strategies and approaches will enhance these thinking skills, the extensive chapter on strategies will be exciting and motivating. Conklin even provides material on classroom management techniques, differentiation, and higher-order thinking skills for the English language learner. She concludes by addressing the questions of assessment and planning.

How can I learn one more complex model in addition to what I am already doing in the classroom?

It has long been my belief that emphasizing higher-order thinking skills is not so much a complex instructional model as it is the addition of a variety of simple strategies to enhance thinking. One simple strategy has to do with the kind of questions the teacher asks. It means asking more than yes-no questions. It means asking a question on how the student arrived at a response. It means asking students to wrestle with the material to compare and contrast or to explain why. It means asking students to figure out the relevance and meaning to his or her life. These questions do not take that much time, but end up dramatically transforming the classroom experience.

As Conklin emphasizes, the teacher can also enhance critical and creative thinking with graphic organizers, problem-solving exercises, decision-making strategies, games, creative activities, project-based learning, or very open-ended tasks.

Whether as a teacher you are adept at differentiation, cooperative learning, multiple intelligences, curriculum mapping, flexible grouping, or authentic assessment, you will easily increase the level of higher-order thinking skills in your classroom by incorporating material from this book into your teaching.

—R. Bruce Williams
Author of *Higher Order Thinking Skills:
Challenging All Students to Achieve*

Acknowledgements

My memory fails me when I think back to teachers offering me opportunities for higher-order thinking as a young student. But not too long ago, I stumbled upon a scrapbook filled with projects from my elementary school days. The humor in my India brochure surprised me. A teacher's note gave evidence of how I used my creative abilities to create a newscast as well as a slideshow to entertain parents at our open house. I pay tribute to those teachers who gave me open-ended assignments to complete so that my talents could shine. It was not until college that an American politics instructor forced me to think for myself as opposed to spouting out memorized facts. This instructor led me down the path to becoming a critical thinker—a priceless gift.

During my graduate years, I took a class on creativity taught by Sue Hodgkinson, whose life was an inspiration to everyone who knew her. She taught me the value of pushing myself to be a more creative individual. That is the reason that as a 40-year-old, I enrolled in beginner guitar lessons. I am nowhere near being a competent guitarist yet, but taking lessons forces me to take risks and expand my abilities. Someday, I'll bring my guitar to professional development trainings. I have got a lot more practicing to do before then, though.

Now, as an adult, I am particularly aware of my children's creative and critical thinking, and I know to appreciate it. Dinnertimes are filled with lively conversation instigated by Jordan and Raegan. *If you could be any superhero, which one would you be and what powers would you have?* I make concerted efforts to teach them to think for themselves and to not believe everything they hear until they have checked out the facts. We discuss our biases as well as those of others. My children are the ones who make me utilize higher-order thinking daily.

I am grateful for many others who have had a role in my success in one way or another. For the kindergarten teachers at Chandler Oaks Elementary School, who so graciously granted me hours of their time in exchange for some measly pizza. For Sara Johnson, my wise editor who talks me back from the ledge when I get overwhelmed. For my husband, who supports my talents, even when it means tearing up our furniture for my latest reupholstering project or joining me at the gym for a challenging workout.

I am indebted to all of you for helping me see (in the words of Ralph Waldo Emerson) that it is not the length of life that I should covet, but the depth.

Thank you.

—Wendy Conklin

A Brief Introduction to Higher-Order Thinking Skills

How in the world can I get my kids to think on higher levels when I have to worry about standardized tests?

Struggling students are not capable of higher-order thinking.

How do you teach higher-order thinking?

I've got too many English language learners in my class to worry about this right now.

It sounds like a waste of time. We've got to cover content!

I'm not creative myself, so how can I teach students to be that way?

Such are the comments, questions, or thoughts of many teachers. Today's educators are under a tremendous amount of pressure to enable students to successfully pass standardized tests, and many of their jobs depend on this. Some schools with struggling populations of students focus on just passing the test. Other schools with achieving populations concentrate their efforts on students receiving commendable scores on the

tests. And while both of these are significant accomplishments and require a great deal of hard work, where does higher-order thinking fit into this context, and what makes it an important skill? To know the answer to this question, we first have to look closely at the characteristics of higher-order thinking, see what it has to do with rigor, and then examine how higher-order thinking benefits students.

Characteristics of Higher-Order Thinking Skills

Higher-order thinking skills encompass both critical thinking and creative thinking.

Critical thinking is the term that most people associate with higher-order thinking skills. It has been a buzzword in educational circles for some time. Everyone is in agreement when educational institutions say they want to produce students who are critical thinkers. Who does not want students to become critical thinkers? The topic is so popular that some colleges are even offering courses in critical thinking. So, what is critical thinking? Narrowly defined, critical thinking is characterized by careful analysis and judgment.

The National Council for Excellence in Critical Thinking Instruction says, “Critical thinking is self-guided, self-disciplined thinking which attempts to reason at the highest level of quality in a fair-minded way. People who think critically consistently attempt to live rationally, reasonably, empathically” (Scriven and Paul 1987). What Scriven and Paul are saying is that when critical thinkers are posed with a problem, they prompt their learning. They commit themselves to think logically about a topic and refuse to jump to conclusions. They struggle to put away the biases that come so naturally and endeavor to look at a situation in a new way so that it can be analyzed and evaluated in a logical manner. And, they reflect on what they learned.

John Dewey was a believer in reflective thinking. He described reflective thinking as an active, persistent, and careful review of something that is believed (Dewey 1916). The active learner does not just accept information passively. He or she looks for evidence to support the information. If no evidence is found, the piece of information cannot be believed. Instead of being told what to think, a person must think for himself or herself. And he or she must give good cause for the conclusions that are reached. In essence, reflective thinking is critical thinking. It is thinking about thinking, what some people refer to as metacognition. It is taking control of learning and being continually conscious and committed to asking *why*. A more contemporary expert in the field has said it this way: “Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do” (Norris and Ennis 1989).

Creative thinking is also a higher-order thinking skill and is equally as important as critical thinking. In the book *Curriculum 21: Essential Education for a Changing World*, Heidi Hayes Jacobs says that curriculum should go beyond giving tools for reasonable and logical thinking. Curriculum should also nurture creativity in all learners (Jacobs 2010).

Inventing and synthesizing characterizes creative thinking. *Create* means to bring something into existence that was not there previously. And, that which was brought into existence must have value. Creative thinking is the process of bringing about a new idea.

Lest anyone misunderstand, creative thinking is work. Like critical thinking, creative

thinking is also active. Michael Michalko, author of *Thinkertoys: A Handbook of Creative-Thinking Techniques*, says, “Creativity is not an accident, not something that is genetically determined. It is not a result of some easily learned magic trick or secret, but a consequence of your intention to be creative and your determination to learn and use creative-thinking strategies” (2006, Introduction XVII).

As noted previously, many people erroneously believe that some are born with creativity and some are not. A leading authority in the field of creative thinking, Edward De Bono, says creativity is a skill that everyone can learn and have (2008). He says that not everyone will have the same outcomes or skill levels. Just as some people are better at playing basketball, some people will be better at creativity than others. However, all people can learn how to play basketball, and all people can learn the skill of creative thinking.

While we are on the topic of creativity, let us talk about being creative teachers. I work with many teachers in workshops around the country who insist that they are not creative individuals. I believe they are wrong. Negativity keeps teachers from being creative. They do not believe they can be creative. In believing these things, teachers have let their attitudes determine their abilities. Michalko says, “Every time we pretend to have an attitude and go through the motions, we trigger the emotions we create and strengthen the attitude we wish to cultivate...To be creative, you have to believe and act as if you are creative...Once you believe you are creative, you will begin to believe in the worth of your ideas, and you will have the persistence to implement them” (2006, Introduction XIV). Regardless of what teachers’ abilities really are, to be the very best teachers (the kind of teachers who change students’ lives), they must be creative.

How can teachers plan higher-order thinking lessons? The idea is to start small, with just one lesson a week. They can enlist the help of other teachers, use the strategies in this book, and search for activities that promote higher-order thinking. Teachers can have the insight to see opportunities when students pose good questions and know what to do in those situations. Being creative is essential to being a good teacher. These teachers will appreciate creativity when they see it in their students, knowing that this behavior will benefit their students.

Both critical-thinking skills and creative-thinking skills come together under the heading of higher-order thinking skills that are grounded in lower-level thinking. To think about a topic at a higher level, understanding that topic is a given. Students have to know the basic facts, understand the concepts, and apply what they know so that they can pick the topic apart through analysis, make a judgment call, or create something new based on the idea. For example, when students are asked to create a new setting of a story and then tell how that would change the story, students must know the definition of a setting in a story. The more complex question is built upon the basic question. Another example would be asking students to write an adventure story about visiting a planet in the solar system, using actual facts about the planet. Students incorporate all the facts they learn, but also produce a product that is original and creative. Again, higher-order thinking in this example is based on understanding lower-level facts.

Is Bloom’s Taxonomy Related to Higher-Order Thinking?

Most teachers are familiar with Bloom’s Taxonomy of the Cognitive Domain, more commonly called Bloom’s Taxonomy. In a nutshell, Bloom’s Taxonomy classifies intellectual behavior into six levels of thinking. The lowest levels of thinking require basic recognition or recall. The highest levels of thinking require critical and creative thinking. (In recent years, Bloom’s Taxonomy has undergone a makeover of sorts. The reasons for this will be addressed more thoroughly in [Chapter 5](#).) Categorizing higher-order thinking skills in this way often makes sense for many teachers because it is something with which they are familiar. For years, it has been part of undergraduate teacher-preparatory classes and professional development for current teachers. Bloom’s Taxonomy has a significant role in helping us understand higher-order thinking skills.

Rigor Is Involved

According to Strong, Silver, and Perini, “rigor is the goal of helping students develop the capacity to understand content that is complex, ambiguous, provocative, and personally or emotionally challenging” (2001, 7).

Think about the types of content that are listed above in this definition. If we take this definition apart, we see that rigor has many facets. Some content is more complex than others, which makes it more rigorous. For example, the recession that many countries around the world experienced during 2010 would be a rigorous topic to study because it is comprised of many layers of complexity. Content that is ambiguous does not offer just one problem or one answer—it offers multiple things to sort and consider. Provocative content is rigorous because it conceptually challenges students to face dilemmas, identify problems, engage in inquiry, and take sides in arguments, such as W. E. B. Du Bois and Booker T. Washington’s diverse approaches to equality for African Americans. Rigorous content that challenges students emotionally or personally could be displayed by covering topics in the Middle East, or abolitionist John Brown’s actions at Harper’s Ferry.

In their book, *Teaching What Matters Most: Standards and Strategies for Raising Student Achievement*, the authors state strongly that *all* students need rigorous content. They assert the belief that one of the reasons that schools fail is that they withhold rigor from some of their students. They feel that all students, regardless of ability levels, need rigorous content with whatever direct instruction is needed to manage the complex content (Strong, Silver, and Perini 2001).

So how does rigor fit in with higher-order thinking skills? Rigorous content provides students a venue through which they can use higher-level thinking skills. Rigor cannot be accomplished if it is not coupled with thinking skills.

All standards are written with some level of thinking or cognition required by the student. For example, the student will understand that the universe is made up of planets. This standard requires a very low level of rigor and low level of thinking. The student will analyze the planets to find which ones have a more conducive environment for life. This standard requires a higher level of rigor and a higher level of thinking. Rigor stresses *quality over quantity*. Rigor and higher-order thinking go hand in hand. Students incorporate higher-order thinking when they encounter rigorous content. It is a happy marriage. You cannot have one without the other.

The Necessity of Higher-Order Thinking Skills

While it sounds good to say that never has there been a more urgent time when we need to encourage our students to develop and use higher-order thinking skills, there has never been a time in history when this was *not* needed. And, it is still as important as it has ever been for *at least* two very simple reasons: we want our students to be successful in school, and we want them to grow up to be adults who contribute positively to society.

Do higher-order thinking skills contribute to academic achievement? Stanley Pogrow (2005) is the creator of a curriculum called HOTS which emphasizes higher-order thinking skills. More than 25 years ago, he started his program for educationally disadvantaged students. These students either had learning disabilities or were identified for the Title I program. The goal of HOTS was to increase test scores and academic achievement by increasing socialization skills and thinking skills. No extra test drills or teaching to the test were included. Over time, 2,600 schools with about half a million disadvantaged students adopted his program. These schools used a variety of standardized tests so that the program could not be tailored to any one certain test. Subsequent results have shown that these economically disadvantaged students' scores significantly increased in both reading comprehension and mathematics.

When considering the necessity of higher-order thinking skills, it is important to think about what happens to students when they leave the classrooms. Students eventually grow into adults. These adults make decisions that, at times, affect all of us globally. At other times, these adults' decisions affect those immediately around them. No one lives in a vacuum. Teaching students how to think both critically and creatively is a priceless gift. It will affect how they live the rest of their lives and will make them lifelong learners.

When students watch commercials on television, many of them believe everything that is said. But, they are not the only ones who get taken in by these commercials. Many adults fall for this, too. It is in our nature, as people, to be passive. It is so much easier to be a passive receiver of this information than it is to be an active receiver. My own kids hear a rumor on the Internet about their favorite movie star, and they assume that it is true. No higher-order thinking is involved. And they continue believing the rumor until I ask them how they know that this rumor is true. They pause and think about it. They try to support their views and look for other proof. Suddenly, they are active learners instead of passive learners.

Many classrooms center on creating passive receivers of information. Who of us is not guilty of telling our students what to think instead of how to think for themselves? It is in teachers' nature to enjoy being important, or at least important enough to tell our students what to think. Students have to listen to their teachers, or at least pretend to listen. Perhaps that is why some students complain of boring classes. Higher-order thinking causes students to struggle and requires that students be active learners. Active learning is hard work, but it is also fun and engaging.

How does a teacher set up a classroom that transforms passive thinkers into active thinkers? The first step to doing this is for teachers to stop being the provider of all information. This does not mean that teachers stop teaching or planning what needs to be taught. On the contrary, it means that teachers begin crafting lessons that demand more

from students than just recalling, summarizing, and identifying. But, how do we do that? Specific strategies that can be infused in content will be discussed in detail in [Chapter 5](#).

In recent years, it seems that some teachers have gotten away from the idea that learning is fun. Teachers need to remember that there is excitement and satisfaction in learning. As an adult, I love grappling with something that is ambiguous or controversial. I have found the joy of facing my own biases and seeking to either change them or validate them with proof. This process of higher-order thinking makes us come alive. It makes us care. And I would argue that it makes us better human beings. Teaching lessons that are infused with higher-order thinking skills will make the classroom come alive, too. Students will awaken and care about the content and, in the process, reach the ultimate goal of learning.

Conclusion

Higher-order thinking skills encompass both critical and creative thinking. This requires learners to be active, not passive. A student is an active learner when he or she analyzes, evaluates, and creates. When a student is a receiver of information, he or she is a passive learner. Concrete examples of higher-order thinking can be easily seen in the top three levels of Bloom's Taxonomy of the Cognitive Domain. Rigor and higher-order thinking go hand-in-hand because students naturally use higher-order thinking when they encounter rigorous content. The benefits of infusing higher-order thinking skills in the classroom are twofold. Higher-order thinking skills will increase academic achievement as well as produce lifelong learners.

Let's Think and Discuss

1. In what ways have you used higher-order thinking skills in your classroom?
2. When studying about any subject, is it a necessity that students think on lower levels first before they can successfully use higher-order thinking? Why or why not?
3. How do you feel your students will respond to using higher-order thinking skills?

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