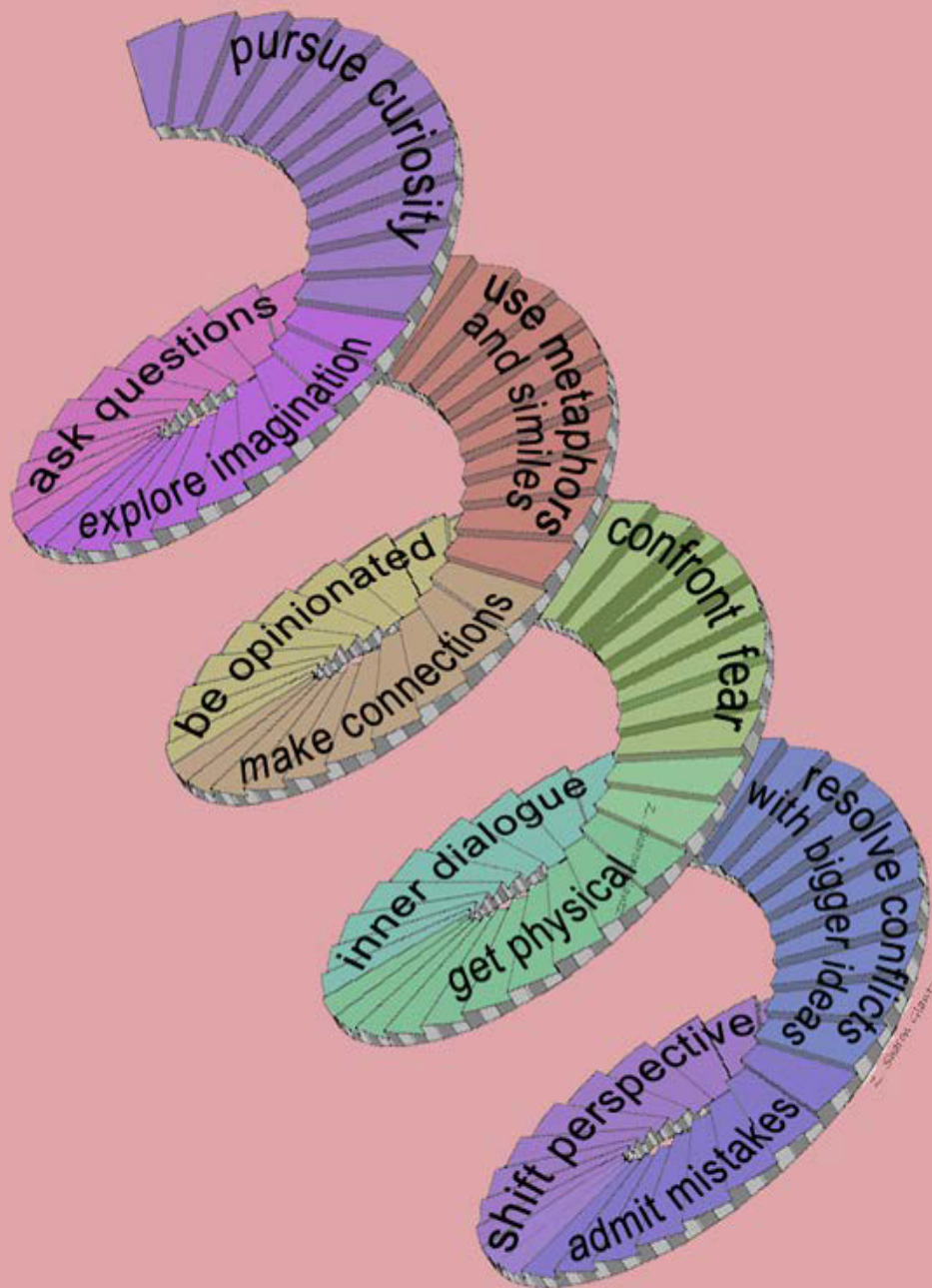


# The Spiral of Creative Thinking



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## **INTRODUCTION**

Creative thinking skills push learners beyond their usual systems of thought to explore, embrace and synthesize new ideas. The Dramafied Spiral of Creative Thinking uses narrative learning to give greater depth and understanding to what is known and what is being learned. Skills development using the Dramafied Spiral acknowledges the behavioral management required for the emotions that arise during the creative thinking process and offers strategies to manage these feelings. Like athletes who train their bodies to respond without conscious thought, learning the Dramafied Spiral trains learners in overcoming resistance and managing the emotions that emerge to resolve problems through innovation and to accomplish goals. The act of writing offers a fast-track training regime for developing creative thinking skills with the Dramafied Spiral.

### **1. CREATIVE THINKING**

Creative thinking is not currently valued as much as critical thinking in education. The Common Core Standards used in most instruction are research and evidence based, aligned with college and career expectations, all of which focus on critical thinking. Critical thinking tends to be more deductive, proving arguments with supporting evidence. Creative thinking is more inductive, using detail to discover bigger ideas. Unlike critical thinking, creative thinking uses risk-taking and atypical combinations to uncover and perceive new ways of merging concepts and ideas. These skills not only help those studying the humanities, but enhance the thinking abilities of those in the sciences. (The Creative Thinking VALUE Rubric, 2009)

Creative thinking follows a dramatic arc that includes emotional components; thus the use of the word “dramafied.” When the intention and ideas are disjointed or new knowledge triggers emotional baggage, the creative thinker experiences periods of chaos and confusion. Robert Bilder applied Stuart Kauffman’s work on chaos and the self-organizing systems

spanning thermodynamic, economic, and biochemical systems to creativity: “at the edge of chaos’ the states are maximally novel while still connected to states in the ordered regime, and thus are most likely to manifest the combination of novelty and utility that is the hallmark of creativity.” Skills development using the Dramafied Spiral can help learners move through the disorienting periods of creative thinking.

## **2. NARRATIVE IN LEARNING**

Media dominates attention in today’s world. Effective advertising uses narrative to harness the attention of audiences so that they will draw directed conclusions. Sometimes these conclusions are related to the products being sold; other times conclusions support an idea companies wish consumers to associate with their product. Narrative, storytelling and providing consistent compelling content to build the picture of a company is integral to how consumers scrutinize brands and businesses. (Bacon 2013) These same strategies support education.

Companies enhance their brand by using characters, sometimes those featured in other media, including:

- The Most Interesting Man in the world for Dos Equis
- the Energizer Bunny for Energizer batteries
- Colonel Sanders for KFC
- Aflac the Duck for Aflac Insurance
- Talking Gecko for Geico
- Mr. Peanut for Planters Nuts
- Smokey Bear for the United States Forest Service

Once the characters are established, companies vary their stories to target different markets.

Narratives from television shows and games are useful tools for developing active creative thinking skills. Steven Johnson suggested: “Think of the cognitive benefits conventionally ascribed to reading: attention, patience, retention, the parsing of narrative threads. Over the last half-century, programming on TV has increased the demands it places on precisely these mental faculties.” Television and other narrative media no longer need to be seen as passive and mind-numbing; they can be interactive tools for learning.

Education has always embraced the use of documentaries, feature films, news and other media programming. During a ceremony in Oxford at which a building in the education department was named in his honor, James S. Brunner, a pioneer in cognitive development said:

Why are we so intellectually dismissive towards narrative? Why are we inclined to treat it as rather a trashy, if entertaining, way of thinking about and talking about what we do with our minds? Storytelling performs the dual cultural functions of making the strange familiar and ourselves private and distinctive. If pupils are encouraged to think about the different outcomes that could have resulted from a set of circumstances, they are demonstrating usability of knowledge about a subject. Rather than just retaining knowledge and facts, they go beyond them to use their imaginations to think about other outcomes, as they don't need the completion of a logical argument to understand a story. This helps them to think about facing the future, and it stimulates the teacher too.

The use of narrative throughout an entire course has many benefits in addition to establishing a more cohesive instructional design. As a story moves forward, the stakes get higher and plots unfold, harnessing and maintaining the attention of learners. As learners become invested in the characters, they become more concerned about what happens to them.

Narrative bypasses a learner's resistance to pursuing new knowledge when couched in action, character evolution and character relationships. Bradford W. Mort et al claim:

Narrative could well form the basis for entire curricula. Because narrative seems to play such a central role in memory by providing an organizing structure for new experiences and knowledge, one can envision a narrative-centered curriculum that leverages the organizational features of our innate metacognitive apparatus for understanding and crafting stories.

Narrative learning is especially helpful for retention in massive open online courses (MOOC's), online learning, flipped, augmented or blended classrooms. Characters show natural reactions to stimuli and model appropriate responses as well as demonstrate the consequences of inappropriate responses and behaviors. Learners feel safer challenging the choices of characters rather than challenging their own choices. Projecting their fears and frustrations onto the characters is one way for learners to work through the emotional issues that arise as they develop creative thinking skills. In looking at social learning theory Andrew Bandura claimed:

Man's capacity to learn by observation enables him to acquire large, integrated units of behavior by example without having to build up the patterns gradually by tedious trial and error... Fearful and defensive behavior can be extinguished vicariously by observing others engaged in feared activities without any adverse consequences.

### **3. THE DRAMAFIED SPIRAL OF CREATIVE THINKING**

The Dramafied Spiral of Creative Thinking is like a three dimensional twelve layered staircase that winds learners deeper into ways of thinking about ideas, solving problems and

synthesizing new knowledge to fulfill an intention. In applying the Dramafied Spiral to creative thinking, the intention is an aim or goal such as:

- shaping a concept
- solving a problem
- developing an idea
- completing an assignment

Creative thinkers may alter or modify their intention as a means of clarification. However, maintaining the core intention drives the forward motion around and through the Dramafied Spiral to produce results.

The first challenge of creative thinkers is to recognize they will need new knowledge to fulfill their intention. However, they encounter a conundrum. The Dutch theory of *wet van de remmende voorsprong* suggests that getting an initial head start in a given area can become a handicap in the long-term. In other words, knowing can get in the way of learning because what is known is familiar and comfortable. Michael Michalko rephrases this theory when talking about creative thinking by suggesting:

Over-familiarization with something – an idea, a procedure, a system – is a trap. Where creative thinking is concerned, that is the irony of the skill: the more adept you are at something, the less likely you are to look at it in a different way; the greater your skill of a particular discipline, the less you will be tempted to experiment with different approaches.

The goal of the Dramafied Spiral is to break through old methods of thought and familiar patterns to embrace and synthesize new knowledge to fulfill the intention. The Dramafied Spiral

is depicted as somewhat linear, but the path of creative thinking means backtracking, taking leaps to the next step, periods of wandering aimlessly or other variations. The articulated path of the Dramafied Spiral is especially helpful when learners feel stuck, their thinking becomes circuitous, they hit emotional roadblocks or they resist moving forward into new ways of thinking.



FIGURE 1. The Dramafied Spiral of Creative Thinking

The Dramafied Spiral encourages “sigmos,” or significant moments. These resemble the “ah ha” moment of recognition and insight that often comes after an emotional or mental breakthrough. Part of developing creative thinking skills is learning to decide which sigmos are helpful for the task at hand and which are personal experiential moments of illumination. Some sigmos move thinking forward; however, others are a diversion. They feel right at the moment

but distract from the core intention. Regardless, sigmos are a positive and valuable side effect of thinking.

The narrative of Penny's experience learning creative thinking demonstrates how the Dramafied Spiral works in a narrative context. Penny is a student who has agreed to work with Chaco, a creative thinking mentor, to develop her creative thinking skills. Her character development and her story of learning creative thinking correlate with Dramafied Spiral. Her story is exemplary and reflects the emotional challenges of creative thinking.

*Penny never thought of herself as particularly creative. She started as a math major because she thought of herself as logical and scientific. However, she found no joy in the abstraction of math and changed her major to architecture. Chaco, her mentor, claimed creative thinking skills would help her succeed. She thought of herself as mentally fearless and wanted every advantage. She figured she had nothing to lose, so she committed herself to Dramafied Spiral of Creative Thinking.*

### **3.1 Pursue Curiosity.**

*Penny remembered her curiosity about slugs when she was young. The feel of their gooey bodies as she tried cleansing them of slime still burned in her memory. Her mother didn't appreciate the pile of slugs in the sink or the mucus stained towels, but Penny truly cared for her new pets. Penny freaked out when her sister covered them in salt and they melted before her eyes. From that time forth, she froze and sometimes panicked at the sight of a slug or a glistening trail of slime, especially if she knew a salt shaker was nearby.*

Curiosity is part of the foundation of creative thinking. To be curious is to reach beyond uncertainty without forethought. Curiosity is about the desire for new information, sometimes



with a passionate desire for knowledge, other times with a drive to understand why and how that knowledge works. Curiosity in others requires empathy to understand why they think and feel the way they do. Creative thinkers focus their curiosity with the aim of fulfilling their intention.

Pursuing curiosity is instinctive before it is later conditioned by outside influences. A lack of curiosity can result in information gaps that lead to misinformation and stereotypes. Curiosity changes during the course of life, growing weaker for those in whom it is innately weak, stronger in those in whom it is innately strong. (McDougall 1918) The skills development aspect of curiosity for the creative thinker requires recognizing gaps in knowledge and pursuing the information necessary to fill in the gaps to avoid replacing thinking with reactivity. Focusing curiosity as a way of fulfilling an intention takes practice; however, distractions into other areas of thought can also serve the creative thinker.

### **3.2 Explore imagination.**

*Penny recognized her imagination had changed over the years. She remembered building forts with tables, chairs and her mother's old sheets. She did a lot of planning to assure complete coverage. Sometimes the fort was a fort and she was the general. Other times she imagined it was a castle and she was empress. When her friends came over, they hid inside and pretended they were making magic. No wonder she grew up wanting to design and build things.*

Imagination is another part of the foundation of creative thinking. Creative imagination is a natural psychological function of the human mind and brain. (Valett 1983) Children are naturally imaginative; adults have to work a little harder to push beyond reality. Imagination is a private journey into the unknown that ranges from the possible to the fantastic.

The skills development aspect of imagination is the practice of letting go control over conscious thought and watching the theater of the mind unfold. Imagination can be ignited by sensory stimuli, emotional reactions, an idea, environmental circumstances, dreams or other factors. The results of activities such as daydreaming can be personal as well as universal, full of symbolism and archetypes. “What if” scenarios can spark the imagination. Some learners maintain the childhood skill of imagination better than others.

### **3.3 Ask Questions.**

*Penny was relieved to find that creative thinking required research. She loved collecting data and learning new terminology. She found research much easier than thinking. However, Chaco kept pushing her away from questioning details to focus on questioning the ramifications of those details. Penny thought this could result in ineffective generalizations, but did find looking at the bigger picture interesting and inspiring.*

Asking questions is provocative and the first step in actively developing creative thinking skills. Formulating questions is a means of articulating curiosity and imagination. Questions will lead to answers or more questions which will inspire further investigation. Some questions may not have answers but will push the boundaries of current thinking.

The act of questioning is challenging for those from certain cultures where questioning, especially questioning an authority, is not acceptable. Not having questions can also demonstrate the fear of change that comes with embracing new knowledge. In either case, a more active approach will be necessary. Journalistic questions of who, what, why, when, where and how can activate the questioning process. Replacing “I don’t know” with “I don’t know but what I do know is ...” is another approach. “Yes” or “no” answers need to be explained.

Questioning is integral to creative thinking; nor is there necessarily a right or wrong answer to the questions asked.

### **3.4 Use metaphors or similes.**

*Penny valued abstract thinking in the form of numbers and symbols, but struggled to find metaphors and similes to articulate her thoughts. To her, using literary conventions were as counterintuitive as finding the whole number that answered the equation of an integral that ranged from zero to infinity. Ah ha, she thought. Penny felt a window open in her mind to a different way of focusing her ideas.*

Metaphors and similes help answer questions when answers are not concrete or tend to be elusive. They support abstract thinking and offer a deeper understanding through comparison or analogy. This form of abstract thinking brings together different arenas of thinking and doing, indirectly offering clarification or insight about both the answers and the questions themselves. Metaphors and similes bridge the gap between what is known and what is being learned. They are as much a part of our functioning as our sense of touch. (Lackoff 2003)

Abstract thinking through the use of metaphors and similes can be playful and amusing. Even the silliest of metaphors or similes can prove effective for understanding complex ideas. However, forcing metaphors or similes to fit will cause blockages or circular logic which will mean discarding them. Knowing when a metaphor or simile is effective requires practice and the willingness to recognize when they distract from intention.

### **3.5 Make Connections.**

*Penny had some cool ideas about how to design the perfect kitchen but also knew that if she really wanted a successful design, she would have to think like a cook. After taking a*

*cooking class, she realized her cool design would require dramatic changes but rearranging how she thought about the project was overwhelming. Chaco suggested that the only way to avoid being overwhelmed was to not only make connections between the design and cooking, but to build relationships with cooks to better understand their needs.*

Compartmentalization of knowledge and experience makes it easier to retrieve information from memory. In creative thinking, tendrils of knowledge and experience reach out until they connect. These connections require reorganizing the compartments as new relationships between previously compartmentalized knowledge are formed. This can be initially disconcerting. Knowledge, ideas and their relationships are fluid; therefore, their compartments are also fluid.

Connecting ideas from different areas of knowledge and experience can produce innovation. Proctor & Gamble uses a model that includes elements that originate outside the company and has proven profitable: “Among the most successful products we’ve brought to market through connect and develop are Olay Regenerist, Swiffer Dusters, and the Crest SpinBrush.” Creative thinking skills include managing connections between ideas, as well as their relationships, by paying attention to how they interact and support the creative thinker’s intention.

### **3.6 Be Opinionated.**

*Penny balked when her mentor, Chaco, told her the next layer was to have an opinion and asked her what she thought about the cook. She didn’t like or respect the cook she consulted, but why create conflict? When she refused to answer, he accused her of being a chicken. She was taught to keep her opinions to herself to better get along with others. Penny was more than a little angry at Chaco and told him so. She surprised herself at her volatile*

*outburst. However, after yelling at him at the top of her lungs, she felt guilty. She was shocked when he laughed and congratulated her.*

The creative thinker tries on opinions like clothing to see what fits. Keeping an open mind often starts with having an opinion. Trying on an opinion in opposition to the original intention offers insight into the thoughts and feelings behind that opposing view. Exploring opposing opinions with others leads to empathy, insight or even stigmas. The creative thinker explores differences of opinion without malice; nor do differences have to be reconciled or homogenized to be acceptable. There is no need to agree to disagree. Simply disagree.

Taking a stand is dramatic because it can provoke conflict. Conflict produces discomfort. However, discomfort is part of the process of learning creative thinking and is unavoidable. Deliberate conflict or controversy can produce interesting results. David W. Johnson and Robert T. Johnson discussed the benefits of controversy in academic settings:

Structured controversy results in creative insights by forcing students to view a problem from different perspectives and reformulate it in ways that allow the emergence of new orientations to the problem; and an increase in the number and quality of students' ideas, feelings of stimulation and enjoyment, and originality of expression in problem-solving resulting in greater emotional commitment to solving the problem, greater enjoyment of the process, and more imaginative solutions.

Stating an opinion is challenging for learners taught to comply with authority figures. They will need extra practice and support expressing their opinions and dealing with conflict. The learning curve for developing these skills will be steeper for these learners. Skills

development in maintaining emotional boundaries, using language effectively and focusing on the intellectual aspects of an opinion are vital to the creative thinker.

### **3.7 Confront Fear.**

*Penny sulked. Having yelled at Chaco, she now felt vulnerable and uncomfortable. She was convinced Chaco was playing her with all this creative thinking idiocy. She'd read about artists reaching critical mass in their process and going a little nuts, but she wasn't built that way. Or was she? Was she going mad? Penny felt out of control. Whenever she felt this way, she was scared her rational mind would never kick in again. However, Chaco calling her a chicken motivated her to move forward.*

Vulnerability from directly confronting conflict may trigger the type of fear that promotes chaotic thinking and irrationality. Denial is easy; finding the source of fear and calming the mind is far more challenging. Some creative thinkers possess the skills needed to manage fear on their own. Many manage their fear and vulnerability by talking with confidants and peers, or even a professional. Confronting fear is a highly personal process and each individual learner will find strategies that work. Some learners will need more guidance than others. However, the benefits of acknowledging and overcoming fear far outweigh ignoring it.

Creative thinkers celebrate change, even though the fear of change is instinctive and primal. Volatile reactions to negligible stimuli are often a way of covering fear. The more intense the reaction, the more likely something personal other than a reaction to the stimuli is being triggered. Creative thinkers learn to recognize these abreactions when they occur and resolve their personal challenges so that they can move their thinking forward. Confronting fear takes resolve, determination, a focus on intention and a willingness to change.

This layer is pivotal as fear inspires emotional functions to battle for dominance. If the battle is lost, creative thinkers will not fulfill their intention or shut down their thinking completely. If won, they move forward and the potential for sigmos is significantly higher. Some learners will need to be cajoled or cheer-leaded through the process; others will need a metaphorical swift kick in the rear.

### **3.8 Get Physical.**

*Penny told Chaco she was a boxer. He held the bag for her and encouraged her to hit it as hard as she dared. She was still rattled and couldn't stop herself from using all of her strength behind her punches. Chaco didn't complain or even flinch. As she focused her hits, it occurred to her that creative thinking had emotional challenges she needed to conquer. Maybe thinking in general had emotional challenges that could be as helpful as they were painful.*

Thinking and emotion happen in the brain that lives in the body. Physical activity not only has the biological benefit of moving the blood, it refocuses the mind and diminishes the intensity of high emotion. Studies have shown that exercise positively impacts the emotional and creative processes. (Colzato et al 2013) (Steinberg et al 1997) (Blanchette et al 2005) Shifting sensory focus to the body supports the incubation of new ideas, opening the mind to new possibilities and enhancing the ability to synthesize new information.

Associating certain physical and creative thinking activities is a way of establishing healthy routines. As the body exerts itself, the mind is distracted, allowing the subconscious to resolve problems or explore new territory in thinking. Physical tasks such as housework or gardening can be even more satisfying when aligned with creative thinking skills development or project design that uses creative thinking. Moving the body is a way of moving the mind.

### 3.9 Inner Dialogues.

*When Penny struggled with an emotional issue, she would hear her grandfather's voice in her head. He had been a chemistry professor and remained her primary role model long after his death. He had believed that emotions were the enemy of thinking. She imagined her grandfather talking to Chaco about emotion and creative thinking. Actually, it was less of a talk and more of an impassioned argument. Both sides made sense and helped her better appreciate the differing ways her grandfather and Chaco thought.*

Creative thinkers use inner dialogues to explore differing points of view and the feelings behind them within the safety of their mind. The inner critic judges, criticizes and resists change. The inner child wants immediate gratification despite the consequences. Other inner voices may reflect specific people who have had a lasting impact. Inner dialogues can be simple as thinking about a more clever response to something someone else said. They can include pondering about being interviewed on a talk show. More complex inner dialogues include debating with famous thinkers, anthropomorphizing a conversation between animals or explaining complex concepts to a child. Inner dialogues are an active process of understanding the different ways thoughts and feelings are expressed.

Inner dialogues support the learning of empathy and the use of empathy to learn. Taking on the perspectives of others offers an opportunity to take a more objective view of oneself that can then be reproduced by self-talk; self-talk allows a reproduction of the appraisals received from others. (Morin 1983) The objectivity gained from an inner dialogue allows the creative thinker to stay in control while embroiled in conflict. With practice, objectivity and control helps the creative thinker focus on the motivation and emotion behind the differing perspectives of conflict, opening the door to new understanding.



Although more subtle than confronting fear, the layer of exploring inner dialogues has an emotional component that can more easily trigger sigmos. Exploring inner dialogues and empathy promotes changes that are both mental and emotional. These changes give depth and meaning to the intention of the creative thinker.

### **3.10 Resolve Conflicts with Bigger Ideas.**

*Penny told Chaco about her grandfather and he clapped his hands with joy at her the inner dialogue she had had in her head. He asked her why she appreciated her grandfather's way of thinking. She told him how he had helped her understand calculus. She was surprised to learn how calculus brought arithmetic together to form a new language so that problems could be solved in many different ways.*

Finding bigger ideas requires inductive reasoning, the process of generating bigger ideas based on specifics, so that conflicting ideas come together in a concept that encompasses both. In this case, the process of resolving conflicts with bigger ideas assumes neither idea is true or false; they are components in a larger frame of reference. That larger frame of reference is not necessarily absolute, but does contain both components in a reasonable way and reflects the creative thinker's intention.

Inductive reasoning is less about results and more about the thinking process. Not all opposing ideas can be reconciled; not all conflicts can be resolved. The bigger ideas derived may seem silly, illogical, unreasonable or lead to unusable generalizations. However, creative thinkers recognize this and learn to use these bigger ideas to validate or clarify their original intention. In the sciences, creative thinking through inductive reasoning is a valuable strategy because a researcher's own creativity and ingenuity shapes the outcome of the reasoning process. (Ketokivi and Mantere 2010)

### 3.11 Admit Failure.

*Had Penny failed at pursuing math? Had she given up too soon? Would her grandfather be disappointed in her if he were still alive? She thought about how much she had needed his approval even though he had been a curmudgeon who tended to look down on everyone else. He didn't understand her preference for collaborating with others, building things together that they could touch. So yes, she failed pursuing math, failed her grandfather.*

Sometimes taking risks and venturing outside the comfort zone fails to support the creative thinker's original intention. The disappointment can halt them in their tracks. However, creative thinkers learn to use failure to their advantage. Deliberately making an error for someone else to correct and accepting the consequences offers a convoluted validation. Attempting to perform a task beyond one's ability and accepting failure can give insight not only into what it takes to perform that task, but is a way of practicing the act of accepting failure. Regarding strategic management, Paul J.H. Schoemaker said:

When I ask experienced managers in executive programs what they have learned most from life, they usually say mistakes. When I reply, "Since mistakes have been so valuable to you, why don't you make a few more?" they tend to look back at me with puzzled faces.

Upbringing and early education shape how each individual learns to manage the shame that often accompanies failure. The process of overcoming failure is more daunting for some than others. However, these patterns of behavior can change in time or with guidance. The skill of managing the emotional fallout of failure and moving forward gets easier with practice. Avoidance of failure restricts creative thinking; therefore, actively seeking out opportunities to

fail, especially under controlled conditions, help learners move through failure in their own way. Learners who help others deal with their failure are better able to learn how to admit and manage their own failures. Creative thinkers learn to continually remind themselves that failure is a beginning, not an end.

### **3.12 Shift Perspective.**

*Chaco gave Penny a hug, pointing out the challenges of admitting failure and congratulating her on the shift of perspective that admission inspired. The sting of failure was replaced with wonder. The difference wasn't dramatic, but a door to new possibilities opened. She no longer focused on puzzling through problems to find a single answer; she wanted to know the meaning of the problems and the ramifications of the possible answers. It wasn't enough to know how, she wanted to know why.*

At this point in the Dramafied Spiral, creative thinkers rejoice because they know their minds are fully engaged in the process. They possess enough confidence to allow their perspective to change, even if their journey is not over. The euphoria that comes from having embraced and synthesized new knowledge deserves celebration. Even if fulfilling the original intention requires moving through all or part of the Dramafied Spiral again, this shift of perspective offers renewed energy that comes from the joy of creativity.

Shifting perspective may result in modifications to the original intention, giving it deeper meaning and broader scope. Creative thinkers may find the shift inspires new ways of fulfilling their intention. The sigmo of this layer is about the sense of satisfaction, accomplishment and confidence that comes from the creative thinking process more than a single moment of illumination.

Sadly, the emotional effects are temporary and the euphoria subsides. The creative thinker recognizes the mental and emotional roller coaster of creative thinking and plans accordingly. They know that if they clutch tightly onto the state of joy they will be unable to hear and integrate feedback without becoming defensive or resistant. Therefore, they learn to celebrate fully and then get back to the hard work of fulfilling their original intention.

#### 4. THE DRAMAFIED SPIRAL OF CREATIVE THINKING AND WRITING

The Dramafied Spiral can be applied to brainstorming and problem-solving; however, the most effective way to develop creative thinking skills is through the act of writing. When learners express their thoughts and feelings in words they better understand those thoughts and feelings. Reworking what has been written moves the creative thinking process forward.

The Dramafied Spiral correlates with narrative structure and character development for crafting prose, scripts, essays and other written formats in all areas of study. Because developing and finishing a piece of writing often follows the emotional path of the Dramafied Spiral, writing helps learners move through these challenges.



FIGURE 2. The Layers of the Dramafied Spiral and Narrative Structure and Essay

Learners have stories to tell. Like the Dramafied Spiral, learners follow a path that includes periods of backtracking, skipping ahead or wandering aimlessly while writing an entire piece of work. They experience high emotion and sigmos along the way. Translated into the creative writing process, this means rewriting, discarding large chunks of what has been written or working through periods of writer's block. For most learners, merging the development of skills in creative thinking with writing, especially creative writing, enhances the learning of both.

Learners comfortable with deductive reasoning will find their essays gain depth and meaning when the Dramafied Spiral of Creative Thinking is applied. The dynamics and tension of the arguments are heightened, attracting and sustaining the attention of readers. For example, Charles Darwin and Alfred Russel Wallace were both central contributors to the theory of evolution through natural selection. However, Charles Darwin used the "prophetic present," a literary device taken from the Old Testament made popular by Charles Dickens during Darwin's time. The prophetic present left no space between the present and the future, poising the reader on the edge of the unknown. (Beer 2009) The creative thinking and writing style of *On the Origin of Species* likely contributed to it becoming bestseller and Darwin is now best known for evolutionary theory.

#### **4.1 Penny's Narrative.**

Penny's story is one of self-discovery, a subplot or snippet of a larger narrative for coursework that includes creative thinking. For that reason, the conflict is internal and the stakes are not particularly high. However, the goal of her narrative is to reflect many of the thoughts and feelings of learners as they explore the Dramafied Spiral of Creative Thinking.

TABLE 1. Penny's Narrative

pursue curiosity	exposition	Penny uses memory to understand how she has explored curiosity and imagination.
explore imagination		
ask questions	conflict	With Chaco's urging, Penny must think differently when researching to come up with questions, and using metaphors and similes to articulate her ideas.
use metaphors and similes		
make connections	rising action	Penny reaches out to learn more about cooking to design the perfect kitchen, although she doesn't particularly like the cook she consults. However, when Chaco asks for her opinion she refuses to engage in what she sees as conflict. She is enraged when Chaco calls her a chicken, which sends her into fear and irrationality which she must confront.
be opinionated		
confront fear		
get physical	falling action	Chaco helps her by changing her focus to boxing during which time she contemplates the emotion elements of creative thinking.
inner dialogues	plot twist	When Penny imagines her grandfather, a pragmatic scientist, arguing with Chaco about the nature of thinking and feeling, she is surprised to find she can step back and see the value of both arguments.
resolve conflicts with bigger ideas	climax	Penny excitedly applies her newly evolving creative thinking skills to better understanding how her grandfather introduced her to the creative aspects of mathematics.
admit mistakes or failure	falling action	Penny is concerned that she has failed her grandfather by leaving mathematics and pursuing architecture.
shift perspective	denouement	Penny recognizes that she is who she is and that learning creative thinking skills is helping her move forward with what she really wants to do with her life.

The narrative included in coursework would be far more dramatic and include more characters to maintain the attention of learners, propelling them forward into her world, containing additional elements that align with the learning process. Like creative thinking, narrative is not always linear and takes unlikely twists and turns as part of giving depth and meaning.

## 4.2 Penny's Character Development.

Like the narrative of her story, the character development of Penny corresponds to the Dramafied Spiral. Getting to know a protagonist or other character is similar to getting to know a person in real life. Observing her actions and reactions gives insight into who she is, how she thinks and what she feels. At various points, learners feel empathy as she experiences the use of the Dramafied Spiral to develop creative thinking skills. At other points, learners will reject her behavior and replace it with insights into their own behavior. Learners can also use the Dramafied Spiral to better understand how to develop a character.

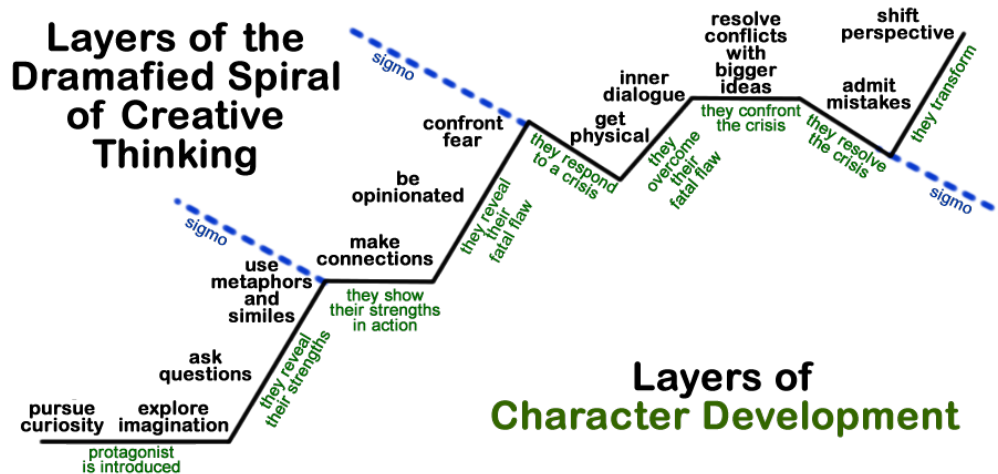


FIGURE 4. The Layers of the Dramafied Spiral and the Layers of Character Development

In reference to fairy tales, Bruno Bettelheim suggested that: “The unrealistic nature of these tales (which narrow-minded rationalists object to) is an important device, because it makes obvious that the fairy tales’ concern is not useful information about the external world, but the inner process taking place in an individual.” With the guidance of educators, the use of characters and narrative can enhance creative thinking skills development using the Dramafied Spiral.

TABLE 2. Penny's Development

pursue curiosity	protagonist is introduced	Penny remembers her sensory exploration into the world of slugs. She also remembers building forts and castles which inspired her to go into architecture.
explore imagination		
ask questions	they reveal their strengths	Penny uses research to help her ask questions and is inspired by Chaco's pushing her to look at the big questions rather than questioning details. Penny struggles to use metaphors and similes until she applies mathematics to her frustrations. (sigmo)
use metaphors and similes		
make connections	they show their strengths in action	Penny learns that the best way to design the perfect kitchen is to connect with the cooking process by connecting with the cooks themselves because research in the abstract is not enough.
be opinionated	they reveal their fatal flaw	Penny resists the idea expressing her negative opinion about the cook with whom she consulted because she sees it as pursuing unnecessary conflict. Thinking herself mentally fearless, she is enraged when Chaco calls her a chicken.
confront fear	they respond to crisis	Penny's anger scares her, making her feel irrational and out of control. At Chaco's suggestion, Penny takes her fear and anger out on a punching bag while contemplating the emotional elements of creative thinking. (sigmo)
get physical		
inner dialogues	they overcome their fatal flaw	Feeling less emotional, Penny imagines her grandfather, a pragmatic scientist, arguing with Chaco about the nature of thinking and feeling. She is surprised to find she can see the value of both arguments.
resolve conflicts with bigger ideas	they confront crisis	Penny excitedly tells Chaco how her grandfather taught her to see calculus as a way of bringing together the arithmetic she learned into a new language and way of thinking – a more creative way of thinking.
admit mistakes or failure	they resolve crises	Penny wonders if her failure at math was a way of failing her grandfather, but recognizes that architecture better suits her nature. (sigmo)
shift perspective	they transform	Penny discovers how learning creative thinking skills will change how she approaches her work in architecture and other parts of her life, although she is still unsure what that will look like.



## CONCLUSION

Creative thinking is the process of reaching beyond what is known; collecting and synthesizing new information to find meaning and a greater depth of understanding, and/or innovating new ideas. The Dramafied Spiral of Creative Thinking is designed to help learners move through a layering process that is mental, emotional and even physical to develop creative thinking skills. When the Dramafied Spiral is taught using narrative learners project their thoughts and feelings onto the characters and the story keeps them engaged. The Dramafied Spiral correlates with the structure of plot and the development character; therefore, writing helps learners with creative thinking skills by putting their thinking into concrete action. Like writing, the Dramafied Spiral is a non-linear process with periods of high emotion. Writing gives learners an outlet to explore, express and manage those emotions. Learning the Dramafied Spiral of creative thinking along with practice and guidance better assures success in all areas of life.

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