The Narrative Imperative: Integrating a Story Culture in the Classroom

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Environmental Scan

One who studies the history of learning recognizes that story is the one of the oldest and most elemental forms of knowing. Story and storytelling precede the art of writing, with the earliest forms of story consisting of the combination oral speech, gestures, and facial expressions. For thousands of years storying has "…evolutionarily rewired the human brain to be predisposed to think in terms of story and to use story structure to create meaning and to make sense of events and other's actions" (Haven, 2007, p.27). Unfortunately, the use of story as a knowledge acquisition tool has declined in the last century significantly in many western cultures during what had become to be known as the modern period and has given rise to a shift away from story and replaced by a focus on scientific inquiry. Unfortunately, the use of story as an knowledge acquisition tool has declined significantly in many western cultures century during what had become to be known as the modern period and has given rise to a shift away from story and replaced by a focus on scientific inquiry. Many attribute this transformation to Guttenberg's printing press when story, especially oral story was a way of becoming 'learned' began to be perceived to be inferior or backward and little more than a primitive form of entertainment fit only for children, the illiterate, and the uneducated (Bradt, 1997; Ong, 1982).

Initiated perhaps, by early successes in psychotherapy and aided by the advent of digital media technologies; we seem to be entering a post-modern era in which story has begun to elevate itself from an art form into an emerging change agent that can transform imagination into action (Coles, 1989). Story is enjoying a modest revival with educators because it relates well to constructivist ideas about teaching and learning. Educators who can be somewhat reluctant towards change are beginning to understand that story is a valid way of knowing things –a "narrative epistemology" as Bradt (1997, p. xi) referred to it. The works of such scholars as Walter Ong, Eric Havelock, Millman Parry, Albert Lord, Jack Goody, and Ivan Illich have done much to reclaim the dynamics of story as a primary mode of communicating, thinking, knowing, and relating (Havelock, 1986). Bradt (1997) suggested that stories "…effect a change in consciousness, a surrendering of defenses, and creative engagement with the imagination" (p. viii). Many educators correlate story to Bruner's ideas about situated cognition; where it has been shown that embedding context in situational (i.e., story) environments helps learners retain and understand information for longer periods of time and with deeper meaning (Bruner, 1986). Situating what is to be learned in terms of story helps learners select, arrange, and organize things in manageable chunks. Because story requires one to suspend their beliefs in order to buy into a premise, a learner is already conditioned to accept change –a necessary precondition to learning. As suggested by some, evaluating story as a learning engine is much more complex than simply situating content (Haven, 2007).

Introduction: What a Story Is

There exists a standardized testing description of a story –a character, a plot, a scene, a conflict, a beginning, middle/end, rising action, and resolution. This descriptive definition helps make students better consumers of stories but is nowhere near an operational one that enables students

to learn how to tell/create or learn from story. The descriptive definition makes a story a thing. In order to get the reader to buy into our premise that integrating story/narrative into the curriculum is a valid exercise we suggest that one agrees with the idea that a story is not a 'thing' but a process–a way of thinking, internalizing, and eventually learning. The concepts of story and literature are equivalent, but are not the same and are often confused. Certainly, literature is mostly made up of stories. Conversely, stories can (and do) exist outside of literature. For example, one can tell their personal story. A story is often the backdrop for effective history lessons and can even be related in small bits and pieces using as little as 144 characters as has been shown repeatedly on frameworks such as Twitter or 1240 characters on Facebook).

In short, one cannot avoid talking about how the various forms of media have influenced what a story is; considering the fact that story should not be thought about in terms of it being a *thing* but a *process of thinking*, communicating and learning. If one agrees with the premise that 'story equals learning' then it follows that the media one uses to communicate a story plays a significant role in and affects that process. Various forms of storying (we use this term in order not to confuse the method of delivery from story constructs in their purest form) are presented in order to better make the case for one's buying into the premise that story is a process and is infused in many aspects of one's life and is utilized as a learning tool to teach and contextualize –from Aesop's Fables to the Bible. This is why it is so unfortunate that fiction and literature have been downplayed and confused in many of the implementations of Common Core Standards in the United States. This confusion may partially account for the deprecation of the latter's use as a foundation in curriculum development.

We suggest strongly that people have a deep-rooted intuitive sense for story as a contextualizer and a learning engine. In this chapter we intend to demonstrate how story is useful in many disciplines, including those that might not seem as obvious namely, math, engineering, and science, among others.

Story Generation Elements

Perhaps a more precise argument for using story as a learning tool revolves around the foundational enablers that push story from being a thing into it being a framework that can be applied to teaching and learning. Branigan (1992) explored the basic concepts of narrative theory with its relation to film and in conjunction with literary analysis. He brought together theories from linguistics and cognitive science, and applies them to the screen to describe the story invention process. According to Branigan story invention boils down to four basic elements**:**

1. **PLACE and TIME** – As noted previously, all lists of essential story elements almost always describe a setting or background in which in the story takes place. This is the means by which the author organizes temporal and spatial data. The main character's life appears to be moving along and his or her background is explained. Time must always pass. In short films and narratives, only those moments that create the crucial 'test' or pose the essential conflict to the main character are shown so that the storyline/through line does not become overly complicated and confusing. In a classical story the 'disruption' occurs in the second act, but sometimes it occurs immediately and the

scenarios/backgrounds are described through a series of flashbacks. This is known as the Goddard effect (Wakeman, 1988).

2. **CAUSE & EFFECT**- That important moment in which the disruption occurs and this aspect sets the plot. The central character usually faces a decision, whether to succumb to the conflict or to fight. In other words, a conflict is not a conflict unless the character notices it and makes some type of judgment. Most often, this conflict/challenge cannot be overcome unless the character goes through a transformation or change and that requirement may also compel the character to go against his or her natural inclinations or morals. In storytelling parlance this is often referred to as the disruption. Recall the moment in the song *Beautiful Boy* by John Lennon that states, "Life is that which happens while you are making other plans."

   This is the key difference between introducing the abstract elements of story in and teaching students how to actually construct/create/invent stories. According to Laycoff (1996) every language in the world has a way in its grammar to express direct causation – a local application of force that has a local effect in place and time. For example, when one drinks a glass of water, the direct causation is that it is gone as soon as you drank. Direct causation is also that element that provides the teachable moment. Once students understand this concept, they begin to learn the importance of critically reading/viewing/listening for causation, which helps transcend story into any genre, whether fiction or non-fiction and making it a useful element in multiple disciplines.

   Indirect causation is less discernable and implies a higher thinking skill. Discovering causation on either level can be intimidating and makes comprehension more difficult if there is more than two or three being implied in a storyline. Causation is a significant element that needs to be embedded in the story in conjunction with two additional constructs that will provide a means to effectively measure the relative teaching efficacy of a story.

3. **JUDGMENT** - A central character is the one who notices the cause/disruption and is the one required to make some reaction or judgment effect. To borrow a term from the video game industry to describe how developers program their characters, each 'allowable action' is limited to the main character's personality strengths/flaws, which makes central conflict and serves to limit (or expand upon) the amount of transformation that (needs) to take place. A story is not a story without developing a confrontation between life and the main character's limitations/strengths. In order for a story to teach judgments about the cause and effect correlations and their impact on a known circumstance and/or a main character type needs to be clearly demonstrated because it is what makes a story outcome more or less predictable. Predictability is key to a story becoming a teaching engine.

4. **COMMUNICATE THE STORY** - Because all stories need both a teller and a listener, a storyteller needs to decide on how they are going to tell the story. This is crucial and leads to the credibility of the story and demonstrates how it is possible to know these events, and acts in a supporting role in the audience suspending its disbelief (Laurel, 1993).

Establishing Significance

Mandler (1984) describes schema theory as a system of thinking about something in terms of organized patterns that group information into related categories so it can be analyzed. Schemata can also be described as preconceived ideas, and/or organized patterns behavior. It is that mental structure of preconceived ideas that create a framework that represents some aspect of the world, a way to perceive it and then collect it, and finally organizes it into newly acquired information. Schemata influence attention so that this new information can be and absorbed and transformed into knowledge.

In her seminal work on analyzing story constructs, Jean Mandler (1984) supports this notion through her analysis of story schema in terms of three prescriptive, leveled, and semantic elements.

- A **PROPOSITION** in this sense refers to Kintsch's schema analysis – a method that involves breaking down a narrative into its most basic elements to make meaning (the supposed *predicate-argument schema* (Kintsch, 1973; Kintsch & van Dijk, 1978). In semantic linguistics, this suggests that an argument is more likely to be retained if the outcome is predictable. This is the framework Branigan's (1992) judgment occurs. The character predicts what they must do in response to the conflict or disruption based on his or her personality (i.e., "allowable actions' in gameplay parlance). Given that the main character is able to overcome his or her shortcomings/emotions, the outcome is predicated on a personal prediction as to the best possible actions. A tragedy occurs when that character is unable to overcome their weaknesses or circumstances.

- A **CAUSAL CHAIN ANALYSIS** is the globally predictable outcome that is based, in part, on principles/elements of nature or circumstance. In the classroom this principle directly relates to the academic principles that are being taught for the specific discipline, such as science experiments, an ethical argument, and is what helps the student map immediate recall. In a story this is often referred to as the 'moral'. While there are often unintended, random consequences also can become 'teachable moments'. In many disciplines casual chain analysis correlates to critical thinking or to brainstorming.

- A **STORY CONSTITUENT** is the part of the construct Mandler refers to as 'story grammar' that connects causality through context and provides long(er) term recall because it is the tool that provides the reader/audience the ability to filter out non-essential 'sentences' scenes (i.e., to read critically). This directly correlates back to Branigan.

People are more likely to notice things that fit into a schema and re-interpret contradictions to the schema as exceptions (or distorting them to fit); as long as the subject–predicate is strongly correlated as noted by Kintsch & van Dijk (1978), making the ending of the story or the results of the through line believable (or credible, as noted by Branigan (1992)) and helps search for and create meaning even when the subject-predicate are not initially obvious. Credibility and

predictability are at the core of the so-called 'teachable moments and endings' presented in a story; even those epic finishes where outcomes may not fit what was predicted.

Schemata can help in understanding the world even in rapidly changing environments. People can often organize new perceptions into mental representations if those situations do not require too complex of a thought process. Even the more complex situations can be quickly internalized when using schema, once thought becomes more automatic through repetition, as is demonstrated in the redundancy that often accompanies children's' stories and fables. Examples of schemata include social schemas, stereotypes, social roles, scripts, worldviews, and archetypes (which explains their use in film school). In story the standard (i.e., archetypical) constructs of plot, character, genre, adding causal chain analysis and tight propositional analysis are the building blocks of story as a teaching engine.

To take this further, Mandler's (1984) combining Kintsch et al's (1973; 1978) semantic analysis and Branigan's (1992) story components appears to suggest that if the three elements "…could be amalgamated into a comprehensive system, it should provide a [learning] theory of great predictive power" (p. 73). In short, we are suggesting that a well thought out curriculum based on these three story creation elements has unlimited potential in the classroom.

Unless a story contains the elements as described, it may fall into a story category, but not necessarily one of educational value. The truth is that not all stories are created equal nor are they all good stories. Most have some of the necessary elements but not all. We intend to build these elements into a story validation index that classroom instructor scan utilize to assess the educative value of a story. In other words, we are moving from describing a story to quantifying their efficacy as a teaching medium using finite terms.

Character Development and Transformation

A significant part of creating a properly conceived learning environment is motivating the learner. While some stories are intrinsically motivating (such as personal stories about 'self'), we recognize that even properly formatted stories are not universally inspiring. A significant element in drawing in listener/viewer/reader into story is to create empathy for its main character(s). This important aspect makes a story credible (relating directly back to the fourth element in Branigan's tetrad). There are certain criteria used to develop a character's profile that need to be present to create a sense of retrospect and self-identification. These are referred to as the transformational aspects of the character's development. This same function is directly related to a story teller making the story's cause and effect element come alive and become believable to enhance the listener/viewer/reader's ability to suspend his or her disbelief (Laurel, 1993).

In a story some person or objectification of a person undergoes a measurable change or transformation based on his or her judgment about how to react to a causal event. The struggle the character goes through is at the core of the story creation. This moment in the story equates to the concept of the 'moral of the story" –shorthand for its teachable moment, and an evaluation of the result or consequence of the decision that the character makes. Cause and effect and value judgments can strongly correlate to a classroom experiment in science, a formula in math class,

or a historical event in a social studies class. Effective transformations tend not to be random but planned and need to tie back to the story's through line. The transformation can be overtly stated or implied, based on the storyteller's creative decisions.

As noted, story can become a powerful tool in the acquisition, transferal, and sharing of knowledge, especially when it is tied to short and long-term cognition. Bruner (1990) described narrative as a non-neutral, personalized account of experience that is based on a person's natural desire to communicate meaning. We suggest Bruner's definition of narrative curriculum is narrower than what we are implying. We ascribe Bruner's approach to being a particular branch of storytelling within a broader construct. Bruner's method does meet one of the key requirements of Branigan's (1992) tetrad and places the narrative on a timeline and assumes "an experience of time" (emphasis on 'experience') rather than just referring to time in a historical sense. This is the basic difference between cataloguing events and narrating them using judgments/analyses about causal chains. Bruner's approach does capture the emotion of the moment, making the event (and the learning of it) active rather than passive; which is an essential element for motivating the learner to acquire knowledge. While Bruner's ideas are certainly tied to narrative storytelling, what appears to be missing are the causal chain (Mandler) analysis and a story's predictive components.

Science Meets Fiction: Theory into Practice

As stated earlier, there has been a shift away from story in all areas of education but especially in the areas of STEM and those areas that are based on scientific inquiry. The question is WHY? Some correctly understand that STEM is really about focusing on processes. Science, math and engineering are based on finding solutions to problems. Educators are beginning to understand the importance of reading and writing as perfect partners for innovating and building science and math solutions based on story constructs.

Papadimitriou (2003), a distinguished professor and engineer at University of California – Berkley, stated two reasons why using narrative in learning situations is fundamental. First and foremost, "…narrative richness is an essential precondition for the self (i.e., there can be no narration without narrator)". This is because we think of ourselves almost exclusively in terms of our mental autobiography. Second, stories are in a certain intrinsic sense interesting in that they are attractive fodder to stimulate memory. Everything else being equal, we are much more likely to remember a story than a logical argument.

One of the most important strategies for effective teaching is one's ability to take complicated concepts and break them down to where they are more easily understood. Story constructs add logical understanding of even more complicated issues. Stories combined with other engaging learning strategies to create content that is difficult to forget. We suggest that integrating storying into lessons not only connects the content specific areas of STEM to each other but also add the dimension of design that proponents of STEAM are asking that we consider. Narrative becomes the 'art' of science and technology teaching. We agree with those who suggest that one reason so many females may be turning away from the STEM is the lack of embedding artistic empathy in the disciplines. Initiatives such as the World Science Festival have renamed events to address this, adding titles such as "Science & Story: The Art of Communicating Science across All

Media." Some scientists have recognized that science is a story and intertwining it into STEM provides the motivation for and conceptualization of the need to dig deeper.

In civil engineering, our entire infrastructure, including both that which has been naturally created and that which is made by man, focuses on the construction, and maintenance, and design of our environments. Story creates a situated continuum using cause and effect scenarios where a judgment needs to be made by the learner/receiver. The following two case studies demonstrate how story can be utilized in two unlikely areas: science/engineering and math. In both cases we assume that the teacher/instructor establishes the premise by teaching the elements of story creation and story schema that we have introduced.

Action Case Study #1: Embedding a story into Engineering Content

The following story is an example of embedding story into an engineering class in which the protagonist is faced with design decisions. The story situates the problems and attempts to create the need. The story and related lesson contain all three elements found in our story index: the story constituent, a causal chain, and a proposition.

The teacher/instructor begins by presenting the class with a backstory to contextualize a series of problem solving *design challenges.*

> *In 1931 in the midst of the Great Depression, Roger Wilson headed out west by train with his mom and sisters in search of work. He had been working with his father, Herman, who had recently passed away from a fatal fall off the roof of a house. Like many people, he could not find work as a bricklayer in rural Alabama, but was encouraged because he had heard about a new government project that was located on the border of Nevada. The local Blount County newspaper posted an advertisement from the Bureau of Reclamation calling for 'practical engineers' to help create one of the largest structures in the world. The Bureau was one of the few agencies that was offering jobs. The local newspaper said that the proposed structure would control the massive floods and retain the water supply for many different areas and use the massive power of water flow to create electricity with water using something called hydroelectric power. Roger was fascinated with this since he had heard that hydroelectric power could create electricity from something called hydropower. He considered himself a 'practical engineer'. While he had no formal education in engineering, he did know that if you could control flowing water you could create waterpower or hydropower. Many criticized the government for this idea stating that it was an impossible task because the whole initiative would be based limited formal engineering design but rather on trial and error because nothing of this size and scope had ever been attempted before.*
>
> *For Roger and his family this meant food on the table and generally a better life. They made the long trip to Black Canyon on the Colorado River only to encounter many others who had the same idea. To stand out, quickly learned that he must work hard and demonstrate that he learned something new every day. He was hired on as a mason. As most of the men were not trained engineers, they were forced to learn brand new skills to understand the construction process and to solve what turned out to be thousands of problems almost daily. The Hoover Dam is still considered one of the most comprehensive examples of the practicing trial and error methods for testing out engineering theories and putting them into practice. No one knew, for example, the best method for diverting water flow, or if concrete could support a structure of this size and scale, or which physical shape for the dam would best suit the need.*

The solutions to the myriad of problems presented while building the dam are classic examples of using feedback loops in engineering brainstorming sessions. It also ties directly

with Common Core State Standards and other standards provided for the engineering industry by IDEO (https://www.ideo.com/).

Design Challenge #1: [Rationale: Storytelling as a tool for knowledge sharing]

> *The Colorado River was one of the most powerful water flows —it was massive. One of the first things the practical engineering group had to deal with was how to divert the water flow and use its power.*

Students are broken onto groups and are asked to decide on the best possible solution to the water diversion problem. Through math and physics algorithms they predict which solutions works best then using examples they test their solutions. The groups get back together and present their possible alternatives. The class then is able to read the test of the story that explains what the actual solution was and then note the 'deltas' in their solutions as compared to the actual one. In this case the students are able to, through the storyline, correlate the problem and its predicted results.

Design Challenge #2: [Rationale: Comparing and contrasting]

> *The story continues….*
>
> *Once the teams of men successful developed strategies and diverted the water flow, there were other issues to overcome and many problems to solve. Among the many other challenges included determining the best physical shape to use in building the dam. Roger and his group brainstormed various alternatives. After much trial and error, they discovered that a shape similar to the trapezoid would work best.*

This time the instructor allows the students to see the final result. The storyline helps them 'connect the dots'. Their task would be to create an explanation as to why the trapezoid would work best. Knowledge building is hierarchical and is revealed through the resolution of the story. Abstract knowledge derived from within one particular context may be found to explain phenomena in other areas. In this case the students are asked to prove an abstract theory that demonstrated the physical characteristics of physical shapes that we have since been proven in a specific applied situation (Smith 1998).

The teacher/instructor should then ask the student to create in a narrative format, using story through lines, examples of the impact and the hypothetical failures that may have taken place on the main character situations. In short, they would alter the story based on the proposed solutions that did not work. These scenarios fit neatly within the framework of IDEO. Each student group investigates the characteristics of each shape and consensus is reached. The idea is to provide a continuum of theories are commensurate/corresponding others. Where possible explanations/contexts of the problems should be unified and explanatory frameworks for the next ones. It is well known in instructional design that developing knowledge in a horizontal fashion offers opportunities that serves as clues and help to personalize the inquiry.

The following picture is shown of the final design drawing for the dam:

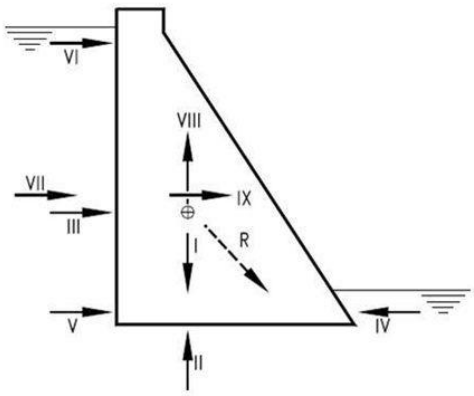

Figure 1: Final Trapezoid Shape of the Hoover Dam

The storyline continues and stopping points are determined with the idea that each challenge is created based on the level of students in the class.

Action Case Study #2: Mathematics in Action

The idea for this lesson started when a teacher/instructor notices that their students are enthusiastic about The Hunger Games books and movies and recognizes the motivational opportunity that this phenomenon presents and decides to integrate the story to teach some abstract math that the students were struggling with. Several mathematical lessons are developed.

> *The Hunger Games is a series of American adventure novels that have created a complete franchise grossing over $2.9 billion worldwide through its movies, books, and merchandise. This captivating story is about twelve districts that were a part of the fictional country of Panham –the ruins of what was once North America. Every year the government forced each of its 12 districts to send one teenage boy and girl to compete until only one survivor remained in The Hunger Games: a nationally televised event.*
>
> *The story follows a teenager named Katniss Everdeen who volunteered to replace her sister, who was chosen for the 74th Hunger Games. Katniss soon finds herself in the arena fighting for her life while becoming entangled in a love story.*

Each lesson examines the games from a different perspective and the students are asked to use their mathematical skills to answer questions and problems that are posed to help them formulate an opinion. In some cases, the students are asked to rewrite the episodes' endings based on mathematical calculations. Each lesson starts with a brief background about what happened and direct quotes from the book to help set the stage for the mathematical concepts being introduced.

Students use data from the book to plug into a mathematical formula to calculate the answer. The lessons are very straightforward and the students did not have to think very critically about the problems. Students were then challenged to use their critical thinking skills to find answers to more complex questions and are asked to formulate *opinions and inferences* –one of the State Standards for ELA and Geometry. For example, while teaching the distance lesson, using quotes from the book, students are asked to determine how far away from the Capitol the games take place from their own hometown using the variables of rate and time. Once students find the

distance, they are asked to determine that, if the train hypothetically started out in their home city, where on the globe the Capitol of Panham was located. Students are asked to research and make calculations to formulate their answers.

Students are then asked to put themselves in Katniss's position and determine whether they would risk running away from the Capitol to get back to her home district (District 12) and to explain their response. Students use their mathematical calculations to decide a risk/reward factor (using percentages) to help Katniss overcome her fear of being caught. Based on their decisions the students are asked to rewrite the ending of the episode to determine the credibility/predictability of the one actually written by the author.

Each lesson requires students to challenge the propositional conclusions of the story episodes. The propositional elements of a story are the *allowable actions* based on the descriptions of the main character's previous actions and personality. Propositional analyses provide some predictability in terms of argument Kintsch & van Dijk (1978). Instead of using Katniss's character traits, students use mathematics to determine possible outcomes. These comparisons help students critically analyze the literary value of the storyline. More often than not, Katniss's decisions will be the same as the mathematical calculations the students make. In the lesson about slopes, in the book Katniss states:

> *"The ground slopes down. I don't particularly like this. Valleys make me feel trapped. I want to be high, like in the hills around District 12, where I can see my enemies approaching. But I have no choice but to keep going."*

At this particular point in the story Katniss had just begun to participate in the games and was looking for water. She had to constantly be self-aware and try to stay hidden. While working together students have to calculate what kind of possible slopes Katniss and her enemies (called *tributes* in the story) would scale while she looked for water and the kind her pursuers would use when chasing her.

In essence, this lesson becomes gamified in that the students are asked to make the same decisions as if they were taking on the role of Katniss inside a role playing game. Students are required to assume that Katniss would end up at the bottom of the slope to find water, making her an easy target. Students are provided two different slope problems to determine the angle of the slope, the position of Katniss and her pursuers, and whether she would be safe. After graphing various slopes students begin to recognize that horizontal slopes are the safest when trying to stay hidden. Students are then asked to explain how it is different from what Katniss intended and why their responses were safer. The lesson demonstrates that if Katniss thought out the process mathematically, she could have a better chance of surviving, which would actually change the propositional conclusion of the storyline. All of these calculations demonstrate mathematically Kintsch & van Dijk's (1978) propositional analysis and its value to story creation.

The class is then asked to extend the storyline using some hypothetical scenarios. What if Katniss did not pay attention to the slope while searching for water? They are asked to hypothesize what might happen in the story. The students are able to provide various answers

like “the other tributes would see her” or “someone could throw something to kill her.” Last, they are asked whether at the beginning of the games; if Katniss did not have her bow and arrow to protect her and if another tribute saw her, how would she defend herself and what are her chances of living? Students were able to observe how this hypothetical scenario might change the outcome of the book.

Using these scenarios students are changing the story schema –mental structures consisting of sets of expectations about the way in which storylines proceed. The story schema enables the reader to form a coherent representation of the story as a whole. The story they create must be cohort with the principles of story constituent, and propositional and causal chain analyses. By having students question the proposition of Katniss they are changing the story schema. Through mathematical equations the students learn probability and predictability and parallel the story through lines in the process.

Conclusion: Story and Cognition

Most would agree that today's educational system and society; in general, is often described using the term *information overload*. Nathan Shedroff (2001) describes the hierarchical differences among data, information, and knowledge –with the latter as the process of making what is observed meaningful and useful. While we pay attention to all three, what is most significant is to discover that story is one of the most useful tools to share knowledge because of what is retained and enduring. Until recently, story has been shown as a tool that is most used for sharing simpler and more general information. In western cultures, traditions in managing knowledge until recently have been shaped by a line of thinking that gives preference to our working with knowledge in an abstract form rather than that gained from direct experimentation or observation. Most personal experiences are immediately intellectualized and transformed into the abstract. This is demonstrated by the preference/desire of many of our youth to live in virtual worlds rather than actually deriving experiences from reality (Kimura, 2000).

Educators are beginning to realize that not all information can be abstracted and correctly categorized into knowledge for long-term memory through deduction alone. Of the two types of processes we use to transform information into useful knowledge (i.e., direct observation and correlating with previous experiences), the former is not always the most efficacious means because our logical, deductive powers cannot always be trusted and are less enduring even though they appear to have the most power because we are often more able to express them using words (Sole &Wilson, 2002). Intuitive knowledge, on the other hand is less transparent and controllable. Sharing knowledge through story often appears to rely upon intuition and experience and is therefore, less obvious as a learning tool in educational settings.

What we have attempted to demonstrate in this chapter through our presentations, background ‘story proof’ research, design challenges, and lesson examples is that, once we discovered that an observable, story creation construct actually exists, we could only conclude that story can be a very useful tool to share not just general information but more abstract forms of knowledge. In brain research it is often noted that story tends to simultaneously activate multiple regions of the brain and multiple sensory memories, making learning and knowledge acquisition more

meaningful and enduring (Sole & Wilson, 2002). Our story-teaching schema is our attempt to quantify and qualify those experiences so that stories can be effectively integrated and utilized in finite terms. The next step is to create a useable rubric for this purpose.

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