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Practicing Creative Thinking Skills by Making Creative Products Related to Economic Issues

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Students need to learn and practice creative thinking skills to ensure success in solving everyday, national, and global problems that include those affecting economic issues. The global economy requires workers to have research and innovation skills that depend upon creativity. However, many current educational programs focus mostly on factual content, doing little to inspire or apply the creative process. The project presented here shows an engaging activity that combines creative thinking skills with economic content. Although the activity occurred in a college course on creativity theory and practice, this challenging game can be easily adapted and embedded in the Kindergarten-12 social studies curriculum. This article discusses the set-up of the activity and its connection to creativity theory and curriculum standards. It showcases the work of eleven participants who each made a unique object or scene from a given set of craft and recycled materials, subsequently relating the resulting product to a current economic issue. Photographs of the resulting products are provided along with descriptions of the theme of each item, its connection to economics, and creative aspects of the work. Suggestions for adaptation to the Kindergarten-12 classroom are given.

Key Words: creativity theory, creative process, economics, current issues, poverty, health, technology, disasters, flow

Introduction

Creativity is an important skill in today's global economy. Globalization since World War II has challenged the economic and strategic leadership of countries who have held positions of power, including America. A significant part of these workforces are in direct competition for employment with lower-wage earners from around the world. Cutting-edge scientific and engineering work is carried out in other countries, and those workers are only a mouse-click away through the Internet (National Research Council, 2005). All countries need inventors and innovators to competitively keep pace with other nations and to solve global environmental problems.

> "Sustainable development is the practice of protecting the environment while improving living standards for all, and invention and innovation is the key to its success. Invention and innovation for sustainable development isn't just developing new technology, but includes new processes and new ways of solving old problems – creative thinking is the rubric… Despite the fact that people everywhere have an innate ability to be creative, rich countries are not doing enough to stimulate and harness invention and creative thinking… due to a combination of factors …[including] education systems that don't inspire or value creativity…" (Lemelson-MIT Program, 2003, p. 4).

To adequately address invention and creativity in schools, teachers need effective activities for practicing and developing creative thinking skills. Such activities can be successfully integrated with social studies lessons, i.e. the topic of economics, as will be seen in the creative game activity described here.

Multinational companies use 13 criteria (Gross, 2003; Mehlman, 2003) in determining where to locate their facilities and the resulting jobs. The third-most important criterion (after cost of labor and availability of capital) for businesses is the availability and quality of research and innovation talent (Gross, 2003). This criterion may be positively affected by classroom instruction focused on strategies for creative thinking and invention. This article outlines an effective activity for practicing creative thinking skills in which students were provided identical sets of craft or recycled items and asked to combine all of these to make a new product conforming to rules and additional criteria. In the following sections, the connections to creativity and social studies standards will be explored, followed by a brief review of important creativity theory, including the concept of *flow* related to the project. Then, the activity will be described in detail before discussing the example creative products of students and providing suggestions for ways to use this activity in K-12 classrooms.

Standards Related to Creativity and Social Studies Addressed by this Activity

The arts are recognized as core academic subjects in federal law (NCLB Act, 2001) and are supported as essential to education by numerous national education organizations including the National Education Association and the Association for Supervision and Curriculum Development (MENC: The National Association for Music Education, 2011). Certainly, arts integration into education is desirable in our outcomes-driven education atmosphere: "In 1997, The College Board reported that students with four years of study in the arts outscored students with no arts instruction by a combined total of 101 points of the verbal and mathematical portions of the SAT" (MENC: The National Association for Music Education, 2011, Appendix). Additionally, Julia Marshall (2005) delineated three ways arts-integration is pedagogically effective: (1) the arts facilitate connections between concepts using analogies; (2) students involved in creation or interpretation reorganize and reinterpret their knowledge, improving knowledge transfer; and (3) the arts ignite creative thinking. The arts have been successfully integrated with social studies lessons to teach principles of democracy (Trent & Riley, 2009), community harmony (Bresler & Latta, 2009; Viglione, 2009), and craftsmanship (Lindstrom, 1997), along with spatial skills and concepts related to culture (Montgomery & Rule, 2011; Rule, Lockhart, Darrah, & Lindell, 2010; Rule & Montgomery, 2011).

The Partnership for 21st Century Skills (2004) has developed standards for the arts: dance, music, theater and the visual arts (including the media arts). These standards are presented on their 21st Century Skills Map for the Arts (2010). The authors of this document

define creativity as: the ability to demonstrate "originality and inventiveness in work" and the capability to become "open to new and diverse perspectives" (p. 6). It is through this particular form of creativity, the authors of the 21st Century Skills Map for the Arts (2010) purport students will be able to "draw on a variety of sources to generate, evaluate, and select creative ideas to turn into personally meaningful products" (p. 6). The activity described in this article allows students to create a personally meaningful product related to current social studies economic issues.

The National Social Studies Standards (National Council for the Social Studies, 2010) consist of 10 themes. The seventh theme is "Production, distribution, and consumption," which addresses global economic issues and the economic dimensions of other social studies topics. As will be seen in later sections of this article, the creative products produced by students participating in the described game revealed many economics-related social studies issues. Students were able to connect economic topics with their creative products through analogy and symbolism after they produced them and during later reflection that reinforced these concepts.

Creativity Theory

The creative process has been viewed in different ways. A traditional approach has been to identify different stages of creatively solving a problem. As early as 1926, Graham Wallas defined four stages: (1) the preparation stage in which the problem and its requirements are defined with relevant information being gathered; (2) the incubation stage during which the mind works on the problem while the person is occupied with generally non-demanding tasks such as sleeping, swimming, or eating; (3) the illumination stage bringing a sudden awareness of a solution to the problems; and (4) the final verification stage involving a check of the viability of the solution.

Another model using stages was Alex Osborn's (1963) Creative Problem Solving model. This popular model, modified through the years by Sidney Parnes (1981) and Donald Treffinger and Scott Isaksen (2005), resulted in additional steps. Currently there are six steps: (1) mess-finding – identifying a need or problem for which to apply the model; (2) fact-finding – tabulating all that is known about the issue; (3) problem-finding – listing various ways of defining the problem; (4) idea-finding – brainstorming ideas for solving the problem; (5) solution-finding – involving identification of criteria for a good solution; and (6) acceptance-finding – determining how to implement the best ideas. Additionally, Jane Piirto (2004) identified seven "I's" of the creative process: Inspiration, Imagery, Imagination, Intuition, Insight, Incubation, and Improvisation, to which "Implementation" (Davis, Rimm, & Siegle. 2011) can be added.

Creativity may or may not follow a sequence of steps in a model; many creativity models do not require stages. For example, creativity can be considered a change in perception that may be brought about by the use of analogy, model building, mental connections, submersion in an activity, or meditation. Mihalyi Csikszentmihalyi and Rustin Wolfe (2000) envisioned the creative process as three parts of a system. The first part was knowledge of the rules and procedures of the domain. The second part involved knowing the professionals of the domain and their views on what is acceptable. The third part addressed the ability of an individual to produce a unique, valued contribution for the domain accepted by professionals in the field. Some additional creative theories are discussed in the next paragraphs as they have closer connection to the specific game on which this article focuses.

In the activity explored here, students were provided with one of several identical sets of materials from which to make a three-dimensional model. They were required to exhaust all of the items using a limited set of tools and other extras such as glue, thread, and ink from a marker. To increase the challenge and need for creative thinking strategies, the final product needed to also satisfy the student's choice of five criteria from a list of twelve possibilities. As Tim Brown (2008), chief executive officer of the award-winning IDEO Corporation design firm pointed out, one must exhibit playfulness, take risks, make models, and think with the hands to be creative. Consequently, the products created during the activity were three-dimensional models made by hand. To add additional challenge and allow students to revisit their work, each student was required to connect his or her creation with a current economics issue upon completion of the model or object. This ability to re-envision a creation has been shown to be a key ability for creative artists' careers. In a classic longitudinal study of postsecondary art students, Jacob Getzels and Mihalyi Csikszentmihalyi (1976) found that students who could take new approaches to the problem after they had completed their works of art (students who could explain how they might change their drawings to reinterpret the stimulus) experienced more success as artists seven years later.

One current creativity theory espoused by Michael Michalko (2001) holds that the more ideas generated from a variety of perspectives—even after a "good" idea has been found—the more likely that an original, outstanding solution to the problem is among them. The four steps of the productive thinking talent of the Talents Unlimited thinking skills of Carol Schlichter and Ross Palmer (2002) that facilitate generation of ideas can be helpful. These steps are (1) think of many ideas (fluency); (2) generate ideas from different categories (flexibility); (3) produce unusual ideas of which no one else has thought (originality), and (4) add details to the improve the ideas (elaboration). Michalko (2001) believed creative geniuses know where to look for ideas; make their thoughts visible through graphic organizers and visuals; connect ideas—even those that seem unrelated—into novel combinations; join opposites; choose new perspectives, take advantage of mistakes and failures, and work collaboratively with others. With these ideas of Michalko and early actions of many of the stage models of creativity discussed earlier (preparation, mess-finding, fact-finding, problem-finding, inspiration, imagery, imagination) in mind, students participated in two idea-generating activities before making their creative products. The first idea-generating activity involved choosing a random word from a jar of words printed on paper slips and making connections between it and the given materials and suggesting into what these recycled and craft items might be transformed. The second activity involved viewing a slide show of various photographs of items and scenes (chosen from image online searches) and, again, making connections to the project.

Another important creative skill that was identified by E. Paul Torrance, Orlow Ball, and H. Tammy Safter (1992) is "resistance to premature closure" (p. 13). The resistance skill addresses the need to not seize the first reasonable idea that one generates, but to continue to generate ideas so a wealth of interesting options might be examined for the best solution. People who want to solve problems the way they have been accomplished previously, without taking the time to explore other possibilities, prematurely close off a lot of potentially original and useful ideas. Other creative strengths identified by Torrance and his colleagues included: emotional expressiveness; storytelling articulateness; movement or action; three-dimensional, unusual, or internal visualization; richness and sensory appeal of images; fantasy; humor; and breaking

boundaries. This last idea of breaking boundaries or "thinking outside the box," involves risk-taking to break accepted but unspoken rules. Participants in this project were asked to incorporate as many of these creative skills in their work as possible.

Flow

Flow was defined by Mihaly Csikszentmihalyi (2008) as an optimal experience in which a person is challenged at a complex level, stretching his or her skills to the limit to accomplish something difficult and worthwhile. During such a flow experience, the person is aware of harmony of actions directed toward an intrinsic goal, as time and distractions fade away and as the person feels a unity with the activity and other participants. Cultures differ in the degree to which the pursuit of happiness through flow is made possible. All cultures, however, provide people a defense against chaos and random experience by prescribing norms and rules for behavior, setting goals, and building beliefs that allow people to feel secure. This security, combined with a focus of attention on a limited set of goals, may allow people to engage in effortless action within self-created boundaries, thereby experiencing flow. In this article, we describe a complex, creative game providing an opportunity for participants to experience flow while making connections to economic issues in social studies. The game has a given set of materials, well-defined rules, and a set of challenges to ensure participants stretch their creative thinking and craft-making skills. Many of our participants reported a feeling of flow as they created their products. In the next sections, we describe the game, followed by the resulting products, and then our conclusions and recommendations.

The Creative Challenge

Students in a college course focused on creativity theory and practice, along with their instructor and another faculty member interested in creativity, participated in the game, made the products described here during a one-hour period, and worked together to coauthor this article with each person describing his or her work, identifying creative strengths of the work of others, and contributing to the conceptualization, organization, writing, and editing of the work. Because creativity was the main topic of the course, extra challenges were added to the game to ensure that everyone's skills were stretched and that the opportunity for a flow experience was provided. Readers who want to implement this game in their classrooms should consider removing or adding challenges, depending upon creative skill levels of their students. The rules of the game are shown in Table 1. These rules may be changed before the game begins to meet the needs of the class. As noted previously, the last rule was presented to participants after the models had been made to force them to revisit their creations (and students were allowed to make minor adjustments to their work); nevertheless, one could provide this rule at the onset of the activity.

Each student provided a dozen identical low-cost items to be parceled out into the final identical sets of materials for the game. The instructor provided the remaining materials, resulting in the list of materials shown in Table 2. When assembling materials for the game, keep in mind the principles described in this section. A range of color and other physical properties is desirable to allow students to create a large variety of possible attractive products. Some items need to be three-dimensional; others should be mostly linear. Inclusion of something planar such as paper, fabric, or foam sheeting is useful. Materials that readily attach to glue or that can be cut with scissors are easier to manipulate. Also note that the volume of the set of given materials determines the volume of the products. A set of all tiny items will severely

limit the product's size and possible forms. Generally, the set should have at least ten to fifteen different items to ensure that there is enough variation to produce a large range of achievable products. The reader may want to try to reproduce the set of given materials shown here, making substitutions of items with similar physical properties as needed depending upon availability. However, one may want to add something with a distinct color and form to challenge students to think of ways to break mental set and use the item in a unique way. An example of such an item was the miniature paper umbrella that challenged students to use it as something other than an umbrella.

Table 1
Rules for the Game or Project

Rules
1. Every bit of the given materials must be used in the creative product; nothing can be discarded. However, one may place things inside of or below other items.
2. Glue, thread, water, and ink from a marker can be used (in addition to the set of given materials) to make the product.
3. Items may be modified by cutting, tearing, twisting, wadding, wetting, chopping, etc.
4. Items may be attached by glue, thread, piercing, twisting folding, etc.
5. Basic tools of scissors, hole-punch, and needles are provided for temporary use.
6. One hour time limit.
7. The product must represent something related to a current economic social studies issue.

As mentioned in a previous section of this article, students experience flow when they are engaged in a complex activity requiring skillful behavior. To increase the required skill levels, we added a list of challenges, as shown in Table 3. Each class member suggested one of the listed categories and the instructor provided the remaining ideas. Allowing students to choose any five of the criteria opened these challenges to fit a broad spectrum of products. As discussed previously, these challenges can be eliminated, adjusted, or increased, depending on the needs of the class. Making the challenge too easy will result in boredom, while making it too difficult will produce anxiety. Discussing the challenges and fine-tuning them as a class may resolve these issues.

Table 2
Given Materials

Items
Red plastic ribbed drinking straw with four-heart decoration;
Cardboard frozen food tray (15 x 17 x 3 cm.);
Brown corrugated cardboard rectangle (6.5 x 18 cm);
Miniature blue or green paper umbrella with toothpick handle (9 cm. diameter);
Green plastic lid from juice carafe (7 cm. diameter);
Butterscotch candy with yellow translucent wrapper;
White lace (30 x 3 cm.);
Large tan rubber band (30 cm. circumference)
Red wax-covered yarn stick (15 cm. long);

Clear plastic with pink, yellow and blue glittery egg stickers (2, 4, and 4 cm. long)
Blue plastic cap for beverage jug (4 cm. diameter);
Bright pink sticky note (5 x 5 cm.);
Peach cardstock paper (14 x 21cm.);
Three metal paper clips (2.5 cm. long)

Table 3
Additional Challenges

Besides addressing a current social studies issue, at least five of the following must be incorporated into the product:
Representing or containing a mystery;
Something that is controversial;
An invention;
Something from a dark place;
Showing movement;
Part of it represents something living;
Useful or practical;
Youthful;
Humorous;
Imaginary;
Tells a story;
Related to or depicts burning

Creative Products Generated

In this section we describe and illustrate the creative products generated by students who participated in the creativity game project, explaining their connections to current economic issues. We report the personal meanings of the products for the artists who made them. Finally, we discuss the originality and inventiveness displayed in the use of the given materials and other creative strengths of the products.

We begin with an object depicting the human, economic, and ecological earthquake-tsunami-nuclear disaster in Japan, followed by scarcity of resources prompting Moon-mining. Next, is a new vehicle that uses "green" energy along with a beach scene related to oil dependency that alludes to the Gulf oil spill. These are followed by a medical device invention and a painkiller innovation based upon toxins produced by sea snails. The theme of the next product continues the medical trend with the dangers of childhood obesity being depicted in a grave scene. Several artifacts address poverty issues: the need for sports satisfied by an urban skateboard park, a low-income neighborhood crime scene, a picnic shelter converted to a dwelling by a homeless person, and a child-labor scene in a textile factory.

Japanese Kokishi Doll - Japan's Economic Disaster

This creative product represents the earthquake-tsunami-nuclear disaster in Japan through a traditional toy. This object, according to its creator, symbolizes the tremendous losses of Japan through this natural and human-made disaster, emphasizing its impacts on human society and the natural world. Japan, the world's third-largest economy, is facing a major humanitarian and economic disaster—currently the world's largest natural disaster—that may exceed 300 billion

Figure 1. Front of Kokeshi doll representing the earthquake-tsunami-nuclear disaster in Japan.

dollars for the March 11th magnitude 9 earthquake, 15-meter tsunami and ensuing nuclear radiation events (Kubota & Takenaka, 2011). The front of the doll, as shown in Figure 1, shows the familiar short black hairstyle surrounding bruised eyes that reflect the sadness of the event. Shimmering blue tsunami waves meet a glittering yellow sea of floating debris above the forehead. The corrugations of the cardboard around the head depict the vibrations of the earthquake. The several red orbs at the top of the doll represent the red sun circle from the Japanese flag, held horizontally at half-mast, symbolizing human losses. The ribbed red appendages are arms in HAZMAT suiting that will help in solving the problem. The back of the doll (not illustrated) shows wildlife suffering from radiation with a blue radiation symbol near the top. The four feet of a sea turtle around the bottom represents the release of radioactive

water into the ocean, harming wildlife and polluting sea products. The artist who created this product chose the traditional Japanese toy to represent the country's crisis: "I am concerned with ecology and wanted to depict my sorrow at this tremendous ongoing ecological disaster." Unique to this product is the cutting and assembly of the frozen food tray to make a cylindrical three-dimensional object with both a front and a back. Use of the umbrella as a fan on the front of the doll was also original. The umbrella ribs and broken handle were used to represent floating debris on the forehead. Another creative aspect of the doll is that it can open like a Russian Matryoshka doll, symbolizing the international and global effects of the disaster. Two creative strengths well-exemplified in this object are the following: making the round blue cap into a three-pronged radiation symbol allowed the artist to resist the more obvious solution of a circular idea for this item (resistance to premature closure); the sad, bruised eyes, lowered fan (indicating there is no laughter to hide), and the upset insect on the reverse side convey the emotional impact of the event.

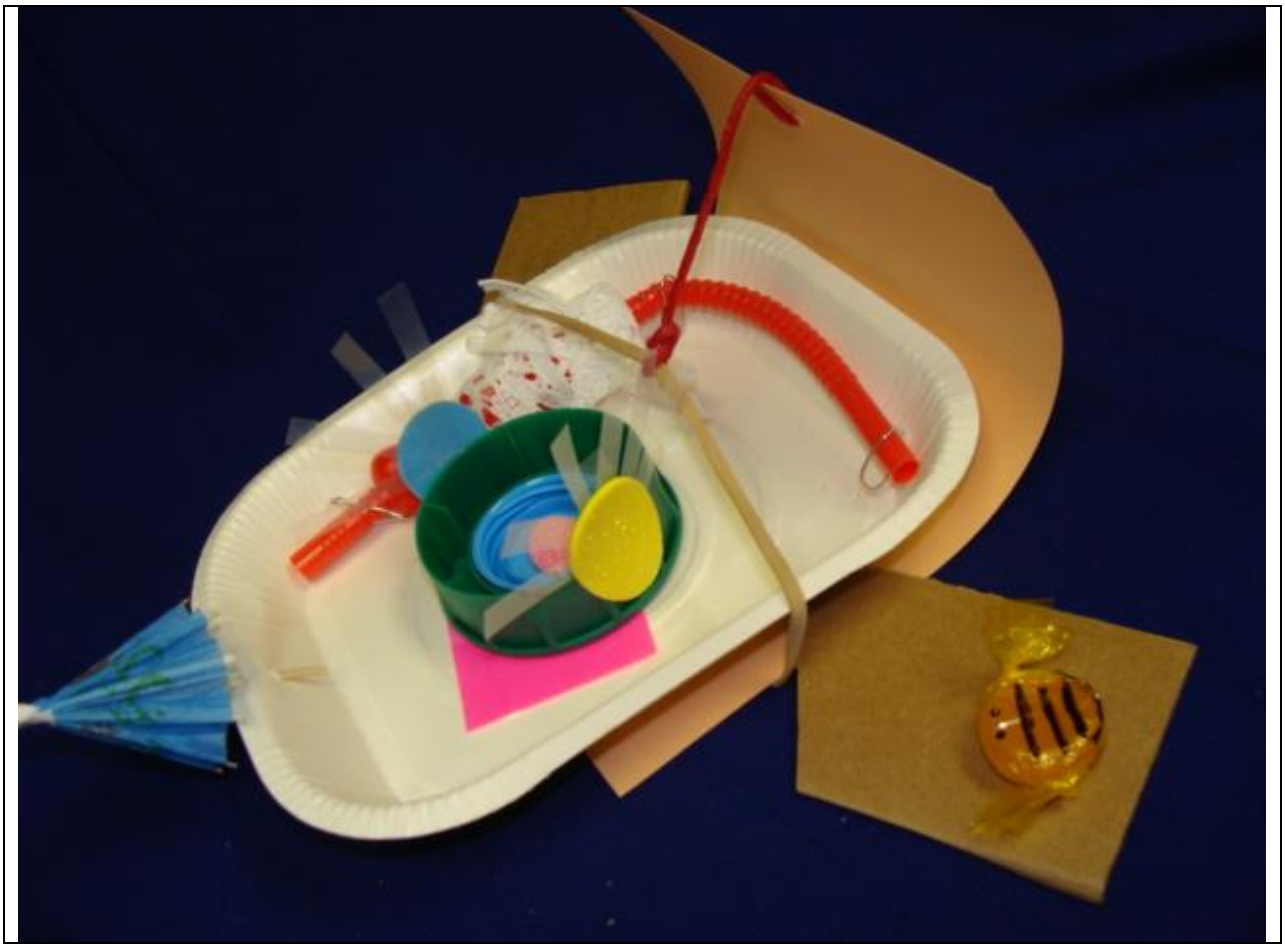

Figure 2. Flying, floating, submersible vehicle that uses wind and solar energies for power.

Alien Moon-Mining Site – Limited Resources

The second project described here represents an alien-landing site on the dark side of the Moon. The explorers arrived via spaceship, bringing equipment for mining, and planting their flag to claim this area. This work represents the problem of limited resources, a pressing problem in the current economy in which rising prices do not guarantee availability. Limited resources on an overpopulated planet lead to conflict, war, food crisis and disease (Palmer et al, 2004). The aliens depicted came to the Moon looking for the better place to live. They represent a nuclear family—two parents and one child—an often-promoted solution for solving the escalating demographic problem. The artist explained the significance of her creation: "I see scarcity of resources as a root cause of many problems that affect all individuals in the modern globalized world." Creative strengths of the product include being humorous and exaggerated in the strange apparel the aliens wear and the excess baggage they brought with them.

Innovative Transportation – Costs of Traditional Fossil Fuels

Figure 2 depicts a multifunctional vehicle that can fly, float, and submerge under water. It uses solar and wind energy as fuels. Lars Perner, of the Marshall School of Business, University of Southern California, described the effect that gasoline prices have on the economy: "Some economists estimate that for every one cent increase in the price of gas, spending in other areas will decline by one billion dollars" (2008, para. 4). This ship is a promotion of alternative sources of fuel that are less expensive and ecologically friendly. The artist described the project's significance: "This product provided a way to share my thoughts and feelings without speaking; art is a language that everyone understands." Several items were employed in unusual ways: the butterscotch candy was transformed into a bumblebee while the two plastic bottle cups became a compass. Another strength of this product is that not only does the product depict a scene involving movement, but the sail on the ship catches blowing air and actually moves the ship.

Volleyball at the Beach – The Gulf Oil Spill Catastrophe

This project represents the impact of the oil spill catastrophe in the Gulf of Mexico from the Deepwater Horizon oilrig in April 2010 as seen through the eyes of beach volleyball players. This scene is only a small representation of how nature, coastal communities and the nation's economy were impacted by this environmental disaster. The oilrig explosion killed workers and others, eventually releasing 206 million gallons of crude oil a mile below the ocean's surface about 50 miles from the southeast coast of Louisiana (Eley, 2011). Additionally, millions of gallons of highly toxic chemical dispersants were dumped in the water in a misguided attempt to alleviate the problem. The white sandy gulf beaches and the water they stretch into, now tar stained, powered fishing industries, tourism, estuaries, marshlands, and other wildlife habitats. The current dependency on oil sometimes causes people to ignore the negative impacts of their energy and fuel choices represented by the oil just below the surface of the sand. The artist made black footprints in the volleyball court to represent how the problem of reliance on oil is surfacing. The artist described the meaning of the plastic score board showing the score of 0-0 indicating a lack of progress and winners. The fan observing the game represents the fact that people are sitting and not doing anything about this dependency and crisis. Creative strengths exhibited by this work include the sensory appeal of the shower having water made of pointy paperclips showing that cleaning the mess will be painful. The butterscotch candy wrapper, representing a volleyball suspended in midair, creates movement in the scene. "However, while

the volleyball appears to be going over the net, it is simply stuck to the net, in the same way we are stuck with this problem." The student found this assignment allowed her to be creative in a seemingly effortless way. When asked to later relate her volleyball scene to an economic issue, she was able to generate many possible connections, demonstrating the ability to keep the problem open to new interpretations.

Figure 3. Medical invention with technological advances.

Inventions and Technological Innovations –Economic Resource Allocation

The artifact shown in Figure 3 represents the rapid growth of technology and its impact on the available economic capital resources within society. Technological advances often assist conservation of funds that can then be directed toward other concerns, but can increase economic costs as some innovations outpace society's ability to grapple with the ramifications of the new technology. The gears on the front created with beverage container caps connected by a rubber band represent technological advances easily seen and identified as desirable and useful in cost savings. The window with the waxed-yarn heart-monitor represents the emotional and ethical complexity of technological advances in the field of medicine. The legs made out of a red plastic straw with shoes fashioned from the scraps of the cardboard food tray represent how technological advances take citizens to situations in which they face moral dilemmas, struggling with both ethical and financial costs to society. A recent example involved a terminally ill

Canadian baby in a permanent vegetative state, denied further life-extending care in Canada, who had been brought to a medical center in Missouri with funding from the New York-based Priests for Life (Olson, 2011). Estimated costs for the child's stay were estimated at $150,000 plus the cost of aircraft transportation, money that might have been directed instead to save the lives of many children in Africa. A creative strength represented by this artifact is the use of movement through the gears made with the rubber band and lids as well as technology's legs. Additionally, the work breaks boundaries because the legs extend beyond the standard box-like outline of the invention.

Snail's Surgery – Costs of Medicines

This product represents a sea snail undergoing surgery to extract a substance that could be turned into a pain killer (Gibbs, 1996). Production of a painkiller from a base substance already available in nature may reduce expenses in significant amounts as sea snails of the genus *Conus* can be found in stable populations (Henderson & Seaby, 1999). These creatures move slowly on the sea bottom, but have venomous harpoon structures (modified teeth) that they use to immobilize and capture faster-moving prey. Painkillers are drugs that constitute a major part of post-surgery treatment. In "Snail's Surgery", the snail symbolizes the potential for a medication and the surgery symbolizes using a natural resource. The artist chose this topic because of the effective use of painkillers he experienced after a recent surgery. The small white cardboard tray was used as the body of the snail while the red plastic ribbed drinking straw symbolized part of the snail's digestion system. Colorful egg stickers were the internal organs where the useful toxin from which the painkiller is produced. A strength of this product is that the scene is a bit humorous in the way it involves surgery on a *snail* (most people would expect "surgery" to involve a person, pet, farm, or zoo animal). This artifact was created with no leftover materials with only minimal cuts or modifications to them.

A Child's Untimely Death – The Economic Toll of Childhood Obesity

The product shown in Figure 4 represents a child who has died from diabetes caused by obesity. The current economic implication is the cost of health care and loss of productivity because of obesity. According to a spokesperson at the Center for Disease Control, the medical care costs of obesity totaled $147 billion in 2008 (Finklelstein, 2009). In this product, a gravesite is represented to show how obesity can lead to death at a young age. The artist placed a US flag at the scene to symbolize that this is a particular problem in American society. Flowers traditionally represent remembrance so they are also included in the product. The scene, according to the artist, is meant to give the viewer a sense of sadness. This product had personal meaning for the artist whose dissertation focuses on prevention and remediation of childhood obesity through appropriate school curricula. The artist created dimensionality by placing the grave higher than the surrounding ground. She also showed a vision of the casket beneath the surface - something a person visiting a gravesite only imagines. She used the lace to create the white areas of the flag and the fancy lining of the coffin. A creative strength of the project was creating a representation that would invoke sympathy, alarm, and a call to action in the viewer. Another creative strength was the unusual internal visualization of the interior of the grave.

Skateboard Park - Meeting Low-Income Urban Youth's Needs for Sports

The skateboard park depicts a scene in which the skateboarders are putting on a show for an audience at a skateboard park. The two-layer cake provides a treat for the family celebration after the performance. Studies have shown that youth who are involved in sports have

Figure 4. Creative product representing the gravesite of an obese child.

opportunities to build positive traits and confidence; enjoy the benefits of healthy relationships with peers and adults; reduce risks from obesity and cardiovascular disease; and prevent involvement in gang violence, tobacco/drug use, and sexual experimentation (Madsen, Gosliner, Woodward-Lopez, & Crawford, 2009). Despite these obvious benefits, Robert Halpern (2003) and others (Hanson & Chen, 2007) have characterized the fitness situation among youth from low-income families as an "epidemic of inactivity." This creative scene, according to the artist, symbolizes the peaceful and harmonious environment of a low-income urban community setting, where people support and encourage young people to participate in sports such as skateboarding. The product emphasizes that sports programs are important community resources for youth development and protection, something that was important to the artist who grew up in a poor urban area herself. Because her parents emphasized outdoor family activities, she was able to avoid becoming involved in gangs or drugs, eventually attending a university. A unique aspect of this product was the use of the red plastic ribbed drinking straw with four-heart decoration to make the skateboarders. Another creative aspect was cutting the frozen food tray to make a three-dimensional skateboard ramp. Several items were used in original ways: the yellow translucent wrapper of the butterscotch candy and the toothpick (umbrella handle) represented the woman's and child's hair; the clear plastic piece became a sun hat; and the umbrella formed a

table cover under the two-layer cake. The creative strengths displayed by this product are emotional expressiveness, storytelling articulateness, and movement.

Figure 5. Low-income neighborhood crime scene.

Low-Income Neighborhood – Poverty

The product shown in Figure 5 represents the differences in socioeconomic status that exist within society through a scene of a low-income neighborhood. The area is run-down; a trashcan is on fire in the street made from the remaining scraps of product construction. A rickety brick apartment building houses many more families than it should, represented by the different colors of curtains and brick pattern on the roof. The fallen body that has been "killed" five ways represents, according to the maker, the opportunities that this individual will not be given. These include, but are not limited to: opportunity for cultural engagement, education, employment, healthcare, and mental health services (Thorbecke, 2005). From the scene, the viewer is unable to determine exactly what method has taken his life. This is important, as all of the missing elements in the individual's life have led to his demise. This product is meaningful to the artist, an educator, as it represents one of the biggest challenges in education at all levels. She stated, "Without addressing differences in socioeconomic status, equality in education cannot be attained." In this artifact, two original approaches to using the given materials are noteworthy. Reinforcement of the plastic straw by lining it with the straightened paper clips produced increased structural integrity by joining its aesthetic qualities with the functionality of the wire paper clips. Additionally, the hard candy was crushed and glued to the paper in a scattered pattern to create broken glass on the street. Based on the findings of the classic study of Jacob Getzels and Philip Jackson (1962) that highly creative students exhibit more violence and humor in their work than others, this product demonstrates attributes of creativity through its presentation of violence and humor.

Homeless Person's Shelter – Loss of Homes and Jobs

A study of stressful life events suffered by homeless people (Muñoz, Vázquez, Bermejo, & Vázquez , 1999) showed that most events (97%) were economic in nature (i.e. loss of employment or another financial crisis) but with half of the people studied additionally having serious health problems (such as drug addiction and mental illness) and one-third having lost a parent, child, or partner. In this artifact, the roofed picnic shelter represents a place where a homeless person can live, work, and eat. The artist chose this topic because of his concern for people living on the street. Green and blue lids were used to make the attractive roof of the shelter. The red pieces of straw were made into benches while the large flat part of cardboard tray represented the picnic shelter's concrete slab. This product exhibits the creative strength of being three-dimensional. Two words that are almost opposites, "homeless" and "shelter" are combined in the title, an example of the creative technique of Janusian thinking or combining antitheses together (Piirto, 2004).

Child Laborer in Textile Factory

The textile factory shown in Figure 6, represents a child in a developing country working in a factory sewing textiles for an American market. The artist as saddened interprets the child because he has left behind the joys of childhood and opportunities for activities that he loves because of the need to work to help support his family. Although this model represents an extreme case, child labor is common in communities with low income and poor institutions (Edmonds & Padcvik, 2005). Such labor provides extremely low wages for items that can be sold for substantial profit in other countries, even when those products are considered very inexpensive in the US market. The artist depicted the child as bound to his seat with his legs missing, and arms also bound so that he can only do the work required in the factory. He is

Figure 6. Front view of child working in a textile factory.

sewing a möbius strip, its continuous surface representing the fact that he will never finish the work. The time clock is broken and positioned so that the child cannot see its face; the child's

time card indicates that he signed in *now* but will sign out *never*. In addition, the umbrella is turned inside out and used for hair on the child laborer, representing the artist's perception that factions supporting child labor in underdeveloped countries are wrongly oriented. The project tells a story of a life of joyful childhood of family love and sweet life, demonstrated through the hearts and candy on the floor and protected from the child's hand by the clear plastic sheet. The child can see these pleasures but not reach them. A creative strength of this product is the power of representation to force the viewer to think personally about the child as an individual, as a real person. Another strength was remaining open to uses of the materials as the project developed. "I originally thought about making a clock and how it might represent *flow* but the other materials called for more complexity in my thinking."

Conclusion

Summary of Creative Aspects of Products and Process

All participants were successful in making a viable creation that satisfied the rules of the game and met the challenges. This was relatively easy for the participants, indicating that these challenges might be increased for future activities. Participants' work showed a broad range of creative strengths and unique uses of the materials. The cardboard tray, for example, was used as a snail's body, a volleyball court, a skateboard ramp, a cylindrical doll, and a house. The red plastic straw was used as various body parts, a trashcan rim, and flag or volleyball poles. Green and blue lids were used as parts of machinery, a compass, a doll stand, radiation symbol, and a garbage can. During the production process students were able to exhaust all the materials provided. Artists reported that it was not always easy for them to use all leftovers from cutting the materials and some were stuffed under other items. The time limitation presented another challenge along with the limited amount of materials. Initially students struggled with different ideas about how to combine materials. Once they began work on their products, they were absorbed in the creative process, becoming totally immersed without distraction in the pleasant working atmosphere. All participants reported a flow experience and sense of satisfaction in having the creative skills to meet the complex challenges of the game.

Transferring to the Kindergarten-12 Classroom

The creative process, when involving a correct balance between skills and challenges, results in the therapeutic experience of flow. Especially at the elementary school level, making creative products on a theme of choice might allow children to express themselves. After the product is made, they can connect it to social studies content as the participants in this example did, thereby making a connection between their personal lives and issues in the wider world.

Younger students might use tape to assemble their items if glue proves too difficult and begin with a more simplified version of the game that contains the general rules, but no additional challenges. Older students, or those involved in gifted education programs, may require additional challenges and may enjoy developing these themselves as a group. Involving students in providing recycled or inexpensive craft materials for the activity may increase ownership and satisfaction in the process. Students in our college class were excited to reveal the items they were contributing to the game.

Creative aspects of each of the products have been described in this article to help the reader understand these characteristics. A teacher may want to discuss with students the various traits of creative works such as original use of materials, added details, emotional expressiveness,

and so forth (see the lists of traits in the introduction). Modeling the creative process for students may be helpful: for example, generating many ideas for the product and then choosing the best, taking time to examine the materials and consider ways each might be incorporated into the desired product, working without distraction to complete the item or scene, and then considering all possible connections to a social studies topic before adding details to solidify the best choice.

Final Comments

This problem-solving activity can help students practice important creative thinking skills, can assist students in thinking divergently, and facilitate new connections to social studies content, allowing students to be more deeply engaged in learning. As students in the examples presented here delved into the literature to support the connections they were making to economics, they felt more personally involved and motivated to explore the social studies topics and a great sense of satisfaction in their work. This is, after all, what social studies teachers want their students to experience. The authors of this article hope that the reader will consider implementing this activity to see firsthand the positive results of integration of creative problem solving in teaching.

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