



Night nests with pests:

A case study of creative placemaking and exploring Sonoran Desert ecology on the OpenSim with middle school students

Mary Stokrocki,
Arizona State University

Key words: Participatory
Research; Creative;
Placemaking; Build Tools;
Community; Ecology; Virtual
World; Pests.

Suggested Citation

Stokrocki, M. (2017). Night nests with pests: A case study of creative placemaking and exploring Sonoran Desert ecology on the OpenSim with middle school students. *The Journal of Art for Life*. 8(11).

Abstract

Using participatory action research methods, this case study reveals problems and solutions, simulated at my hive on the OpenSim site, sponsored by the University of British Columbia. Problems included short time, Internet problems, and students losing their creations. Volunteer students built three-dimensional desert creatures and dome structured nests, changed light effects, chose the ecological theme “Night Nests with Pests,” and included ecological responses. This emerging theme led to correspondence with the website “Ask the Biologist.” What began as a joke about pests, ended in community learning about the importance of pests in an ecosystem as a complex web of interconnected and dependent ingredients. Pests serve as a “warning” sign and need to be accommodated. Artists and community participants, as well as students, can construct a virtual world, build architectural forms, link avatar people, and ideas to explore the nature of creativity, ecological and moral problems.

What kind of creative placemaking can middle school students construct on the OpenSim virtual world to explore an ecological problem? Educators traditionally regarded creativity as a stage of free expression (Lowenfeld & Brittain, 1975,1987). Using Guilford's ideas, Torrance (1974) later developed the concepts of fluency, flexibility, originality, and elaboration of detail to judge students' creativity. Teaching creativity later included strategies for empowering problem solving (Weisberg, 2006) and this process became a social process as well (Vygotsky, 1962). Using an ecological metaphor, Marshall (2005) believed that creativity was linked to

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making connections and Anderson & Milbrandt (2005) added that these connections interrelated art and sociocultural context. In this study, I use creativity as a way of "linking forms" and ideas in creative placemaking.

Creative Placemaking

"Simply put, 'creative placemaking' consists of ways in which communities use the arts to help shape their social, physical, and economic characters – cities and towns literally change when you bring artists to the center of them," according to Rocco Landesman, Chairman, National Endowment for the Arts (Putman, 2012). A place or a home location no longer needs to be geographic. I propose that artists and students can start "placemaking" on a virtual world, building architectural forms, linking avatar people and ideas, and developing community (Hiltuen, 2008).

Virtual World Context: OpenSim

Virtual worlds are digital online community environments that are designed and shared by individuals (Stokrocki, 2014a). OpenSim or OpenSimulator (OS) is a virtual world constructed by 3-D modeling software to make a cyber world environment with multiple users and practices (Opensimulator, 2012). Sponsored by University of British Columbia, my site is under the direction of Dr. Sandrine Han. Huhmarniemi (2008) earlier argued for expanding networks, opening learning spaces, and simulating ecological issues from the real world context. In this study, I explore with students the ecology of the real life desert by simulating the place.

Ecology

Ecology is the study of environmental issues and the ecosystem, a complex web of interconnected and dependent ingredients (Marshall, 2005). It can be a form of placemaking where “changes in one part of an ecosystem will impact other parts—often in surprising and far-reaching ways” (McGonigal, 2011, p. 298). This study explores the ecology of the Sonoran real life desert and its OpenSim counterpart.

Real Life Desert Context

The Sonoran Desert, the hottest Southwestern place in the United States, extends from Arizona and California to northwestern Mexico in Sonora, and Baja California (See (Arizona-Sonora Desert Museum, 2016). Located in the foothills of the Superstition Mountains, the Sonoran Desert School is in Gold Canyon Arizona about 40 minutes east of Phoenix (www.sdschool.org). The small contract school offers online computer classes from fifth grade to high school. This workshop ran for two hours per day for four days during the last week of school in May of 2015. The large computer room (40 x 50') had several Dell Windows computers. The School Administrator downloaded the Firestorm program on the computers in advance. We asked for administrator approval from Dr. Sandrine Han at the University of British Columbia, who hosted our site on her VCER OpenSim, Virtual Commons for Education and Research.

Gamification & Spiral Curriculum Approach

Gamification is “an informal umbrella [term] . . . for the use of video game elements in nongaming systems to improve user experience (UX) and user engagement” (Deterding et al., 2011, p. 1). Games have four traits that include volunteers, goals, rules, and feedback (McGonigal, 2011, p. 21). Based on the spiral curriculum, our gamified pedagogy starts with students experiencing the virtual world user interface (Han, 2015, p. 260). This game approach can spark interest on how students can “take a more active role in reimagining the real world” (McGonigal, 2011, p. 299). My virtual world goal was for students to simulate their Sonoran Desert and build 3-D creatures, nests, and foliage and write a short story about it. This action research is the second cycle of experiments on the OpenSim.

Action Research Methods

This is a continuing action research experiment to construct a virtual world site on an ecological theme of living in the Sonoran Desert using the same real life context and students (Stokrocki, 2016). Evolving from the social sciences, action research involved ways in which teachers can self-examine their own practices (May, 1997). Klein (2014) defined the

research cycle as identifying a focus and methods, collecting data, analyzing and evaluating it, developing an action plan and writing findings. Its goals “address practical problems, generate new knowledge, and initiate change.” Delacruz (2014) reminded teachers that it includes intense participant observation and community engagement. Action research involves continuous involvement and improvement (Robson, 2002) in three stages.

Data collection consisted of pre and post questionnaires, informal student interviews, and daily note taking and screenshots. Content analysis involved searching for repeated words, actions, or themes, as in pre-and post questionnaire results. Researchers gather participant reflections through informal interviews and photo elicitation questions (Stokrocki, 1985). Comparative analysis involved comparison with similar virtual world and ecology studies. Results are interpretations not generalizations that generate insights (Stokrocki, 1997). Galbraith (1997) earlier argued for enhancing art teacher instruction with new technologies [video] and Stokrocki (2014b) overviewed research practices in cyber or virtual worlds, and in this study when exploring virtual world gamification (Han, 2015). Bastos and Zimmerman (2015) argued that connecting creative research and practice in art education is important. Virtual worlds are ideal places for connection.

Study Cycle and Participants

During the first year (last week of May 2014), four-day experiment, students explored the basic 3-D modeling [Build] tools, uploaded 2-D drawings of favorite flora and fauna, and created a small installation (Stokrocki, 2016). In the second year (third week of May, 2015), four-day episode, students built 3-D animals, arranged their nests, wrote a class story, and added final touches. The class consisted of three boy and three girl volunteers. Two boys and one girl returned. One student was Afro-American. Students chose human avatar builder roles. Our basic rule was to help each other as in real life. One continuing student, Jacob, assumed the lead and offered his three-dimensional Giant Rabbit that took one hour to build in the summer as a model for classmates. He also helped coach students who needed assistance with the Build tools throughout the lessons.

Lessons

Most of the lessons were based on the AZ Visual Art Standards Strand I Create, concept 4L meanings or purposes: PO 1011. Students learned to select subject matter in their own artwork and to create with the following OpenSim Build tools:

- Explore Navigation tools that introduce students how to move in this place.
- Use 3-D Modeling tools to build a creature (Han, 2015) and duplicate some parts.

- Link/Select prims (forms): Use two hands to select forms to link. (Place left finger on Shift key and the right finger on the form.)
- Make 3-D Nests (dome): Choose the dome form and 3-D modeling tool features (twist, hollow, taper, and texture) to make a nest and include texture (e.g., students chose cobble).
- Experiment with lighting. Change sun position (midnight, sunset, midday or sunrise) under World on the top menu.
- Try out the simplest animation feature (wind). When an avatar flies close by, the appendages (legs) move.
- Title creatures and write responses on notecards about what the creature is doing for a communal story.

Data Collection

I collected data for this study through a pre-questionnaire, keeping daily participant observation field notes, collecting student comments, taking screenshots and photographing their computer screens, conducting informal student interviews, distributing post-questionnaires, communicating via e-mail, and making follow-up visits with the Administrator and student key informants.

Ecology Pre-questionnaire. Using the same pre-questionnaire as last year, I asked students the same round of questions (See Appendix 1). The first question was, “What is ecology?” Only one student guessed, “Study of the earth.” Then I asked, “What is a desert?” Half of the students remembered that it was a dry and hot place; one student defined it as “an ecosystem that gets 13 inches of rain.” Finally I inquired, “What desert do you live in?” Only two students knew that they lived in the Sonoran Desert (sonron (sic)). Surprisingly 66% knew how to care for the animals and that was to “leave them alone.” Educators can surmise that study of the ecology needs to be addressed as a survival skill.

Building and linking forms. Starting out, Jacob took the lead and demonstrated the 3-D modeling tools or Build process to his classmates. He had experimented with building a large rabbit in the previous summer and it was on display on the site. Students were amazed at its gigantic size and texture. Using the Build tool, Jacob practiced making his a rat, using organic “sculptie” forms and linking them together. Then he created a nest out of two dome forms that he twisted and added a cobble texture (Figure 1) from his Inventory. He helped assist fellow students with technical problems throughout the class.



Figure 1. Jacob built a rat and nest. The arrow configuration will move the forms up/down or in right/left directions.

Uploaded animal faces.

Because students were frustrated with building facial features and running out of time, three students found animal faces on the Internet, uploaded them as textures, mounted them on a cube prim/form, and linked the prim placard to the body. Christian built his beetle from the “sculptie” organic form, a spherical head, cylinder legs, and triangular ears, even though beetles don’t have triangular shaped ear forms (Figure 2).

Wind animation feature. Harla (girl 010) used the Wind feature for her creation, so that her Tarantula’s feet moved in the breeze when an avatar flew by it (Figure 3). Linking forms was difficult for her. Students needed to use two hands for the keys: One to hold the shift key and the other to choose the forms to link at the same time. Later when her animal’s feet moved, she was surprised. “This is hard work!” she complained.



Figure 2. Christian (boy 04) uploaded a rectangular wolf face form and liked it even more than a regular beetle face



Figure 3. Harla’s Tarantula’s feet moved in the breeze, a simple animation, when an avatar flew by it.



Figure 4. Tittle Turtle slowly waddles and hides in her shell and cave nest. When Batty tries to eat her, he breaks his tooth and screams---Ahhhhhhhh!" (Fran, Girl 04).

Animal survival. Some desert creatures develop camouflage and tough surfaces to survive. Students learned that animal coloration changes to blend in with the surrounding landscape, as the Turtle in Figure 4. Fran discovered the correct term for her animal was tortoise. Turtles and tortoises are semantically the same but the tortoise is found in Sonoran desert.

Emerging theme: Night Nests with Pests. On the last day, I asked students to name their creatures and describe their actions. Their replies were creative ecological metaphors:

"At night, Ratty prowls around for prey" (boy 01, Jacob).

"Bluto the Beetle creeps along the dessert (sic) floor, singing the blues" [boy 04, Christian).

"Tittle Turtle slowly waddles and hides in her shell and cave nest. When the bat tries to eat her, he breaks his tooth and screams---Ahhhhhhhh!" (girl 04, Fran)

"Batty Dives & Soars after bugs that glow" (boy 02, Mace).

"Giantua Tarantula scurries & crawls around the desert floor" (girl 01, Harla)

Owlie screeches, "Beware of Ratty!" (girl 03, Ashley). "I didn't mean to scare you," says Ratty, "Let's be friends!" (Jacob, boy 01). See Figure 5.

Students were pleased with their accomplishments, their creature titles and short story script. Their story contained dramatic actions and details in spite of our limited time.



Figure 5. Owlie screeches, "Beware of Ratty!" (girl 03, Ashley) "I didn't mean to scare you," says Ratty, "Let's be friends!" (Jacob, boy 01). [Dusk sun setting]

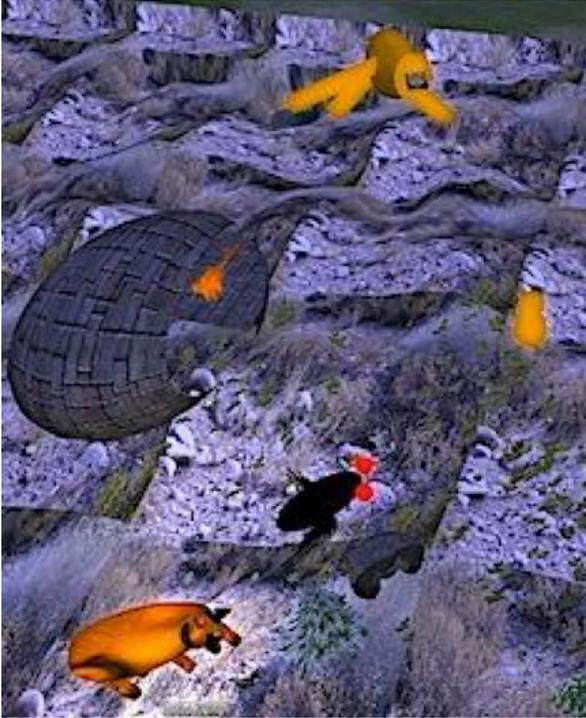


Figure 6. Jacob joked and selected the theme Night Nests with Pests because students could change the Sun settings. [Midnight sun position].

Student key informants. Such responses may seem typical at first, but later students realized deeper connections with their pests. Some students emerged as key informants and offered more information as time evolved. Noteworthy was Jacob, a keenly interested student in the former class. I met him and his parents at our local coffee shop. Jacob kept me abreast on students working independently when I was not there. He joked and selected the theme Night Nests with Pests because students could change the sun setting to night (Figure 6).

Critical review finding-- Student and virtual pests. As in real life, some animals and students find it difficult to concentrate and sit still. Mace here loved to annoy his fellow female students and buzzed around the classroom as well. He however, managed to make a bat, that he called Batty, with glowing red eyes and uploaded wing forms; one is reversed that we found on the Internet (see Figure 7).

Content Analysis

Content analysis is a process of searching for frequent actions (linking problems) and words (frustration), analyzing screenshots and eliciting more information from students to find new meanings. Even though the study was only a four day cycle, I met with key informants sporadically for two years investigating our data to reveal findings that included technical problems, creativity learning, and humanistic concerns. In spite of

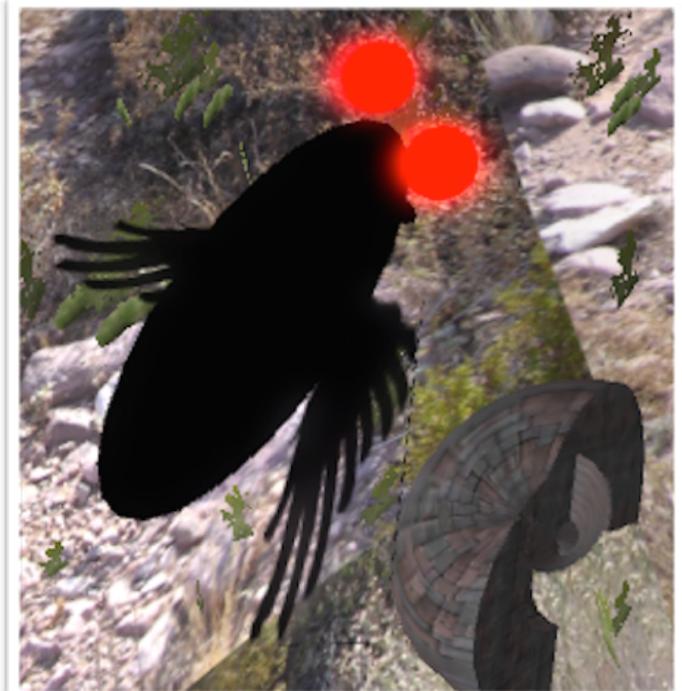


Figure 7. Batty buzzed around the OpenSim and the real life classroom annoying students. These actions became part of his story as well.

frustrating technical problems, the Internet delays, and shutdown of the Firestorm site on the last day, students persisted. They were anxious about linking parts and positioning animals and uploading screenshots of animal faces from the Internet. Lu (2015) also discovered that taking “screenshots can be very creative as well as adjusting camera angles or views” (p. 259).. I elicited more information from students when I carefully explored their screenshots looking for details and additional discoveries (Stokrocki, 1985), in this case, simple flashing (glowing) and moving parts (wind). In addition to solving technical problems and build tool issues, they learned about the pursuit of creativity and its persistence attitude.

Post questionnaire. I asked students some post questions beginning with what is creativity? Answers were insightful and varied. Jacob answered, “I looked under General Setting on the Build tool and found that I was the Creator!” A creator is a builder using the tools. Ashley said that she created [made] the “glow” of animals at night that is the result of changing the sun position option. Students were not expecting this special workshop at the end of the year to be so challenging. They learned that creativity involved patience, persistence, and problem solving as in real life.

Comparative Analysis

Comparative analysis is the practice of interrelating findings or explanations over many class sessions to form everyday insights with other cases and the related studies (Stokrocki, 1997). It is a constant comparison of findings and emerging problems and solutions (Creswell, 2009). These include possible insights and deeper understandings that emerge during a study.

Later, I asked students what was a pest. Jacob said an annoying creature. Then I asked them to go to the website Ask the Biologist (*ASU School of Life Sciences*, n.d.) and leave a question. They received two replies. Dr. Biology answered:

A pest is an animal living where you don't want it. Your neighbor's beloved pets can be your pests. Your wildflowers can be their weeds. The city, county or state you live in may have relevant laws, but those laws change over time. Thus are weeds and pests born (Personal correspondence, Matt Chew, drbio@asu.edu; <http://askabiologist.asu.edu/contact/askaquestion>). (June 01, 2015).

“So, for your students, I would say they are correct not to judge something a pest or not a pest quickly. Each situation deserves some review before we label something a pest, weed, or invasive” (Personal correspondence, Charles Kazilek, Dr. Biology, kazilek@asu.edu, May 27, 2015). Students here learned to be more tolerant of other creatures [including humans], and

careful about eradicating them. Ashley, Avatar Owlie, asked what was next and wanted to pursue more quests next year (see Figure 8).



Figure 8. Owlie continued to ask a question, "So What's Next?"

Comparative analysis with other studies revealed some remarkable conclusions. Further inquiry resulted in emerging questions on the nature of creativity on the OpenSim and moral learning that I discuss in the following section.

Conclusions, Discussion, Implications

My conclusions involve the most significant questions and findings discovered by students and myself. Technical problems will always be an issue on digital and virtual world operations as students learned to build their creatures and nests. Three important questions emerged from the study: What is creativity on the virtual world? What is the significance of their evolving story? How does creative placemaking make us better people?

What is creativity on The OpenSim? Students now regarded themselves as creators. Using the Build tools, they primarily learned how to link prims, a process of three-dimensional construction. They also learned to change environmental lighting effects (such as nightglow), reposition their nests by twisting their domes, and substitute Internet animal faces for facial features when running out of time. They therefore learned that the virtual world is a complicated ecosystem too. In the future, teachers need to allocate more time for practicing linking, and allow students to take the lead in solving problems.

Csikszentmihalyi (1990) explained this creative process, "Contrary to expectation, "flow" usually happens not during relaxing moments of leisure and entertainment, but rather when we are actively involved in a difficult enterprise, in a task that stretches our mental and physical abilities" (p. 23). Virtual world gamification is not mere playing around (Russ, 1993). Students learned that creativity is a challenging process of problem solving and thinking differently. Their installation was a way of worldmaking (Goodman, 1978) of linking forms and linking ideas (Marshall, 2005).

Students didn't create by themselves. They had a model rabbit, built by one of the student's, who practiced making a "sculptie" animal during the previous summer. When I allowed a student to be a leader and co-instructor I was amazed by his spontaneous insights and refreshing ideas, such as his title *Night Nests with Pests*. Burton, Horowitz and Abeles (2000) later referred to the cognitive dimension of creative competencies as "habits of mind," including taking new perspectives, finding problems, and reasoning. These habits include looking for evidence, analyzing it, metaphor-making, engaging multiple intelligences, and transferring thoughts to other disciplines. Students appreciated learning about pests from the biology scientists through e-mail. They didn't fully realize their titles or reactions as learning to make metaphors, a process of using simile or connecting ideas in a sensory way until the next year when I discussed their learning with them. Working with the school's language arts specialist would lead to more interdisciplinary and cooperative connections.

What is the significance of their evolving story? Students and I soon discovered that their action responses were imaginative, such as the title of the OpenSim experience, *Night Nests with Pests*. Their evolving class story was a quest for survival—a process of "getting along." Being a pest is also a sociological story, not only an ecological one. Students can act like pests in a class and annoy others. A pest can also operate as a warning device as well, for example about overpopulation of entities, some dangerous and others are not. Such a predicament is a battle of predator and prey, a theme that I explored with students in similar real life desert ecology studies (Stokrocki with Barnes, & York, 2014c; Stokrocki, 2012). One person's pest is another person's pleasure. As the instructor, I tried to push students to realize that ecological creativity is a striving experience to get along and pests are change agents, thus increasing their user and school community engagement (Deterding et al, 2011, Delacruz, 2014). Brown and Thomas (1999) later argued for understanding creativity as a misrecognized or hidden process of collective bartering or participants influencing each other. So if pests who operate at night, are adapting to their environment in unique ways, then humans need to adapt as well. Hiltunen (2008) explained placemaking as community building in education and does not offer final answers. She regarded it "as a

collage or a social sculpture built across the domains of art and science, in which private and the public intertwine” (Hiltunen, 2008, p. 110).

How does creative placemaking make us better people? Besides learning three-dimensional modeling tools and features, we learned to be problem-solvers and “imagineers.” What began as a joke about pests, ended in the teacher and students learning about the importance of pests in a place. Pests serve as future “warning” signs and need to be accommodated and not always eradicated (e.g. pest control sprays). We all learned that creativity never ends in a rapidly changing place, simulated as well as real world, because problem solving is part of the avatar and human condition, a future moral lesson. Noted biologist Wright explained, “The human imagination is this amazing thing . . . I think this ability is probably one of the most important characteristics of humanity” (McGonigal, 2011, p. 299).

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About the Author



Dr. Mary Stokrocki is Professor of Art and Art Education Area Coordinator, Arizona State University, Fulbright Scholar to Taiwan (2012), and World Bank Consultant to Turkey (1995-1997). She was former Vice-President and World Counselor of the International Society for Education Through Art [8 years] and former President of the United States Society for Education through Art and its Webmaster [10 years]. She received: 2007 College of Arts & Architecture Outstanding Alumni Award, Pennsylvania State University. She won the following National Art Education Association Awards: 2007 Women's Caucus June King McFee Award; 2005 Lowenfeld Award, and 1995 Manual Barkan Award for outstanding research article. She is both a USSEA Marantz Fellow and an NAEA Fellow. She has taught in 14 countries and conducted qualitative research for over 30 years, notably with the Navajo and Apache, The NAEA also re-published her edited book, entitled *Interdisciplinary Art Education: Builds Bridges to Connect Disciplines and Cultures* (2009). Now she teaches and does research on Second Life using Digital Ethnography. New book: Stokrocki, M. (Editor). (2014). *Exploration in Virtual Worlds: New Digital Multi-Media Literacy Investigations for Art Education*. Reston, VA: National Art Education Association. In 2014, she gave the 36 Autobiography Lecture at Oxford, OH celebrating 36 years of the History of Art Education Archives there.

Appendix A: Pre-questionnaire

1. What is Ecology?
 - Don't know
 - Dry place
 - Studies of earth

2. What is a Desert?
 - Dry place that doesn't get much rain
 - Ecosystem that gets 13 inches of rain
 - Studies of the earth
 - Dry
 - Very hot place
 - Don't know

3. What desert do you live in?
 - Don't know
 - Sonoran (boy o3, "sonron" (sic) (Fran)
 - Gold Canyon
 - Arizona [Ash]

4. How to care for them?
 - Leave them alone (Jacob, Mace, let the creatures be (Harlo)
 - Don't know