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Experiencing the Creative Problem Solving Thinking Skills Model in Virtual Worlds

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Experiencing the Creative Problem Solving Thinking Skills Model in Virtual Worlds

A Project in

Creative Studies

by

Juliana Sánchez Trujillo

Submitted in Partial Fulfillment

of the Requirements

for the Degree of

Master of Science

December 2011

Buffalo State College

State University of New York

Department of Creative Studies

Abstract

Creativity is an ability that can be taught and learned. This project intends to encourage

the teaching of creativity through the use of technology. It was designed to build a space

in the virtual world OpenQwaq, where creativity classes can be delivered to students all

over the world. The creation of the space was inspired by the affective skills of dreaming,

playfulness, sensitivity to environment, and tolerance for risk included in the Creative

Problem Solving Thinking Skills Model. These skills are essential to promote change. It

is also a reflection of the factors that might help or hinder the learning of creativity and

the affective skills in virtual environments.

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Juliana Sánchez Trujillo

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December 15th, 2011

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Section One: Background to the Project

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Introduction and Purpose

The purpose of this project is to contribute to the efforts of the International

Center for Studies in Creativity (ICSC) on finding new ways to teach the Creative

Problem Solving Thinking Skills Model (CPS/TSM), framework developed by Puccio,

Mance and Murdock (2011). This model includes cognitive and affective skills.

For purposes of this project I will focus on the affective skills. The word affective

refers to "ways in which we deal with attitudinal and emotional aspects of learning,

including feelings, appreciation, enthusiasm, motivations attitudes and values" (Puccio,

Mance & Murdock, 2011, p. 63). The project will focus on the affective skills of

dreaming, playfulness, sensitivity to environment and tolerance for risk, proposed by

CPS/TSM. The intention will be to provide a space where students from all over the

world can be mindful about their intuition and emotions as they learn the cognitive skills

associated with the different stages of the Creative Problem Solving Process (CPS). The

space will be mainly used to deliver the content of the ICSC class, CRS 559: Principles

of the Creative Problem Solving Process, starting in the spring of 2012. This prototype

will serve as a model in the design of the course content.

The outcome of the project is to create a prototype of a virtual space to deliver an

introductory course of CPS/TSM through the use of technology.

This space will be hosted in the virtual world OpenQwaq. A virtual world is a

network of people that connect through computers in a synchronous way. They do it to

fulfill different purposes. Virtual worlds offer many possibilities to connect and interact with students in distance educational programs. The biggest advantage is that these technological platforms incorporate communications that differ from traditional internet media like emails or instant messaging applications. Emails are mainly asynchronous, don't allow interaction and are hard to keep track of when the volume is big. Instant messaging is synchronous and interactive, but it lacks a visual space and the possibility to perceive body language. Virtual worlds partially eliminate these communication barriers by providing a synchronous place to have physical interactions, with a constant communication flow through the use of voice, video and chat in real time. (Kohler, Matzler & Füller, 2009). The use of Virtual worlds gives more signals about what a person is thinking or doing, as well as a mutual recognition of communicating with a real person. This feeling is known as "telepresence." (Heiphetz &Woodill, 2009).

The learning objectives will be addressed with the following questions: How can we visually engage in the affective skills? How can we address the affective skills in a virtual way? How could we use technology to impart creativity content? What are the things we need to be mindful of when planning educational programs through the use of virtual technologies?

Description

In the fast-changing world that we live in today, education must adapt to the different circumstances and technological trends. The reason is simple; the only way to survive the constant flow of ambiguity that change provides is by learning to be flexible and to communicate in different ways. However, in order to be able to prepare students to

embrace change, the learning needs to be designed in a holistic way that addresses both cognitive and emotional ways of thinking.

The notion of creativity as an ability that can be taught and learned has been highly supported since the Creative Studies Project (Parnes & Noller, 1973) was conducted. Over the past three decades, the ICSC faculty has been constantly looking for new ways to deliver the content in accordance with new emerging educational and technological trends.

The Creative Studies Project, a research study conducted by Sidney Parnes and Ruth Noller (1973) between 1969 and 1971, proved that creativity is an ability that can be taught and learned. The study was performed with freshmen students who took creativity classes over the course of four semesters. As a result, they performed significantly better in English courses and in several creativity assessments in comparison with students that weren't involved in the creativity classes.

The study not only validated the benefits of learning creativity but also opened the door to the creation of a Creative Studies graduate program at the State University of New York College at Buffalo in 1975. The program was originally based on the Creative Problem Solving model first introduced by Alex Osborn (1957). CPS is a process that, through the use of creative and critical thinking, aims to transform ideas into creative solutions (Fancisco & Burnett, 2008; Puccio, Mance & Murdock, 2011).

In 2007, Puccio, Murdock and Mance published a book titled, *Creative Leadership: Skills that drive change*, in which they presented an enhanced framework of the Creative Problem Solving (CPS) process, which highlighted its cognitive (rational) and affective (emotional) aspects.

Currently, the Creative Studies Master of Science degree is delivered using two modalities: a home-based and a distance program. The latter was created in 2000 with the objective of reaching potential students that live outside of the Western New York area. Initially, the program utilized videos of the classes. They were posted on digital platforms that allowed students to hold conversations through the use of discussion boards.

They are still in use today, but it has been creating a lot of frustration given that on-line discussion boards require students to do a great amount of reading, but they don't allow students and faculty to connect with each other or experience real interaction.

As a result, the faculty has been looking for new ways to increase collaboration and communication through the use of technology. In 2009, the student Diego Uribe Larach created a space in the Virtual World (VW), Second Life, the most popular virtual world, on behalf of the International Center for Studies in Creativity (ICSC). In it, the Center had the opportunity to deliver workshops, a few training sessions and some CPS facilitations.

The platform was used only for a short period of time given its steep learning curve and the different technical issues experienced during the educational events. For those reasons, it didn't have a lot of buy-in from either students or faculty.

However, the need for more interaction with the distance students brought the attention onto OpenQwaq, a virtual platform specially designed to facilitate working groups. As part of the exploration process, ICSC started delivering the class, CRS 625: Current Issues in Creative Studies, on OpenQwaq in the fall of 2011. The results have been so positive that the Center is planning to teach other creativity courses using the virtual technology in the spring of 2012.

This project is a collaborative effort with faculty members to design the space for one of those courses. In order to do it, I chose the of CPS/TSM affective skills of dreaming, playfulness, sensitivity for environment and tolerance for risk. The selection was based on personal preferences, making sure that there is at least one skill for the different steps of the process. It will also be a personal reflection of the way I feel during the process when using the space. This goes in accordance with intuitive tools and literature that suggest self-reflection as a way to raise awareness of the environment and increase mindfulness (Burnett & Francisco, 2010; Policastro, 1995; Puccio, Mance & Mudock, 2011).

Rationale

Change is a natural process that we cannot avoid. However, it is not easy to accept given the high levels of uncertainty that new situations might bring into our lives. Therefore, in order to embrace change we need to understand the reasons behind it with both our head and our hearts.

In the book *Switch: How to change when change is hard* (Heath &Heath, 2010), change is explained through a metaphor of an elephant and a rider. The elephant represents the emotional side while the rider portrays the cognitive part. When the rider wants to move in a certain direction but the elephant wants to go in an opposite way, the tension doesn't allow them to go anywhere. However if the elephant feels the motivation and the rider rationally understands the reasons to move in the same direction as the animal, they will be able to move forward in a smooth way. This is what happens with change; we will only be able to buy into it if we understand the why and feel the motivation to do things differently. For instance, if change is going to be encouraged, the

awareness of the cognitive and affective skills should be always present. Sadly, education tends to emphasize our thinking abilities and to leave emotions behind since, often times, it is not considered to be productive (Russ, 1993).

When I was considering ideas for the development of my Master's Project, I came to the realization that my journey through the Creative Studies Program has been of a cyclical nature. I came into the program wanting to learn about creativity, and, in the process, I found myself. A class that had a great impact on me was Holistic Approaches to Creative Problem Solving. In it, I learned about different tools to incorporate mindfulness and intuition into my creativity endeavors. It was very powerful, because it helped me understand that "for anything to change, someone has to start acting differently" (Heath & Heath, 2010, p.4). However, nobody will change unless they understand why the change is necessary and feel in their hearts that it is the right thing to do. The Holistic class exposed me to simple ways to stay mindful of what is going on internally and externally in different situations and to dare to talk about feelings; a subject that for many is considered taboo. I learned how to connect with my intuition and that has made me a better woman, facilitator, and trainer. Many of these learnings and tools are incorporated in this project.

This project is my personal opportunity to close that circle, and what better way to do it than to create a tool where others can feel and learn how to keep the balance between head and heart, while solving problems in a creative way. It will allow me to make the affective skills visible, through the use of technology, so that others don't forget about them in their own educational process.

What this Project Adds Creatively

The project is intended to support the teaching of the affective skills that often times are ignored or not considered as important as the cognitive skills in the creative process. By using Virtual worlds, the teaching won't be just through words or graphs, but through experiencing and feeling the skills. In other words, it is an effort to find new ways to teach affective skills as an essential part of the creative process.

It will also connect the teaching of creativity with new educational trends that are moving towards the use of technology. This will allow us to connect with different types of people and to keep encouraging the diversity of the Creative Studies program.

Section 2: Pertinent Literature

Distance Learning and the Use of Technology

Virtual worlds are increasingly implemented instructional spaces in educational and training settings. The great advantage of these 3D spaces is that they provide environments where students can learn through immersion, collaboration, and first-hand experiences that, often times, could be risky to try in the real world (Chapman & Stone, 2010). It all comes down to delivering experiences rather than just content, and to providing collaboration tools that assure a constant knowledge flow.

Basic Virtual World Concepts

There have been multiple efforts to define virtual worlds (Bardzell, & Odom, 2008; Heiphetz & Woodill, 2010; Twining, 2010). For purposes of this project, the definition that will be use is: "A synchronous, persistent network of people, represented as avatars, facilitated by networked computers" (Bell, 2008, p.2). In other words, it means that Virtual worlds allow people to connect at the same time, through the use of their computers. It is a persistent network, because unlike video games, the existence of the world remains whether if the user is connected to it or not.

Also, the avatars are the people that live in a virtual world. They are the way users graphically see themselves on the screen. Just as characters on a video game, they perform the action the player executes through the use of the computer.

In a VW avatars can fly, travel and communicate in different ways. OpenQwaq offers three pre-made options, which helps to eliminate many problems while users learn how to use the platform. When a user has just a few options to choose from, the focus

will be on the learning and not on understanding the platform to modify the avatar's looks.

The types of avatars that can be found in OpenQwaq are: a human looking animated avatar with casual or formal apparel, a geometric shape that shows video feeds of the user, and a balloon that can be used when the space is very crowded (Figure 1).
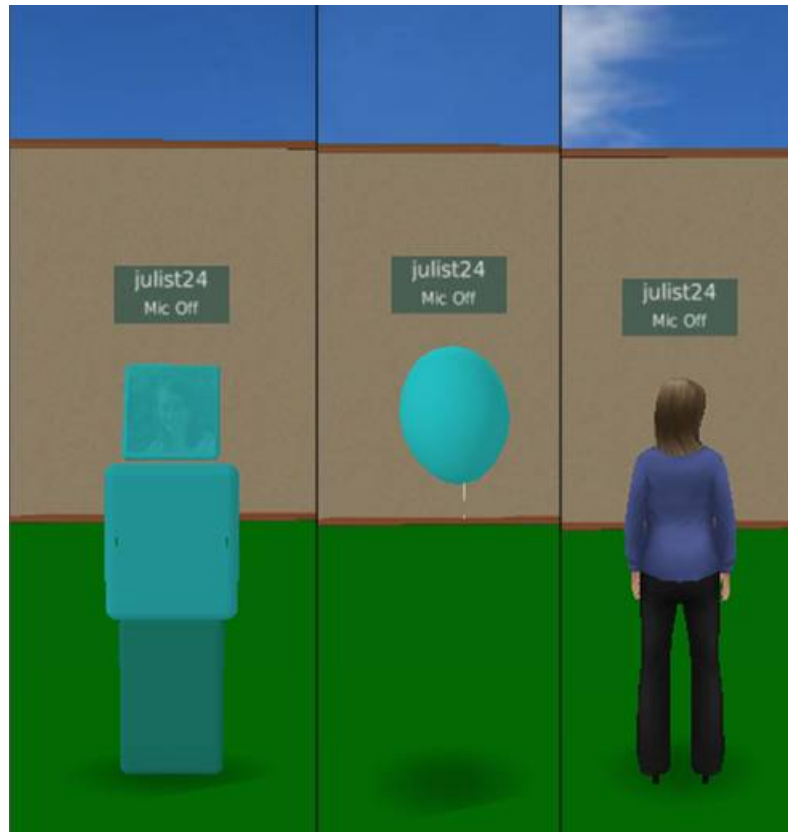
Figure 1. Types of Avatar in OpenQwaq

According to Heiphetz and Woodill (2009) the most popular virtual world platforms used in educational and corporate environments are: Second Life (www.secondlife.com), Forterra System's OLIVE (www. Forterrainc.com), Open Simulator (www.opensimulator.org), ProtonMedia Protosphere (www.protonmedia.com) and OpenQwaq (www.Teleplace.com). These platforms are very similar to each other

and allow users to build islands where avatars can interact in different ways. The differences are mainly based on the types of tools they offer to facilitate those interactions. This project will be developed in the OpenQwaq platform.

The History of Virtual Worlds

The first virtual world was created in 1970. There, individuals could interact with a text-based virtual world that simulated an adventures books (Bartle, 2004). In 1985, this virtual world evolved into multi-user-games (MUG). During this time, multiple MUGs were created and the advances in graphic design and game's capabilities grew tremendously.

The launch of Internet in 1993, made MUG very popular, since players could now play together with users from different parts of the world. Games such as World of Warcraft and Penguins Club were released as a consequence of this online game's boom.

The introduction of Second Life in the market changed the perspective of virtual worlds from video games, to potential spaces for marketing and training. Thanks to its capabilities to simulate real world environments, it became especially popular within companies that needed to train their employees in the use of dangerous equipment or how to face risky situations (Heiphetz & Woodill, 2010). Then it started to also move into distance education.

The use of technology has slowly impacted the classroom. The use of tools such as PowerPoint, smart boards, teleconference, videoconference and webinars are some examples of technological tools used in education. Each one of them has built upon the others, in order to improve the educational experience. Today, the use of Internet

demands more connection, therefore, the use of cellphones, ipads, and websites that allow collaborating in real time are becoming more and more popular.

The advantages of virtual worlds is that they build upon all of these technologies, allowing a video game-based interaction, with the addition of boards to see PowerPoint presentation, chat rooms to communicate through text messages, voice features taken from teleconference and the video feeds that simulate videoconferences. All of these tools help lower the difficulties of not being able to utilize non-verbal communication.

In educational and training virtual environments, one of the biggest limitations is that it is very hard for a facilitator to read participants, and their attention, motivation and interest on the subject (Na Ubon & Kimble, 2002; Özdemir, 2008; Stoerger, 2008). Some additional features in OpenQwaq help reduce this disconnection. For example, when a member or visitor moves the mouse, the avatar's head turns in that direction. When the participant clicks, a laser pointer will originate from the avatar's location. Different avatars have different colors, so it can be easily identified who is clicking on the object. These are simple ways that help identifying some cues of body language and help the facilitator to guide the process.

In OpenQwaq, there are simple cues that indicate the levels of engagement. If a group of avatars is gathered around a particular object, it can mean that their attention is focused on it. Also, the proximity to the object can describe the levels of interest in it. Avatars can shake their heads, nod or bow to show agreement or disagreement with the subject being discussed, or wave, jump or raise their hands when they need to ask a question or are looking for attention. Other ways of communication include sharing

documents, visualizing presentations, having private or public chats and recording ideas though the use of sticky notes.

Knowledge Management in Virtual Worlds

The best way to keep the learning flowing, while engaging both affective and cognitive skills in the educational process, is through the application of the knowledge management principles. Knowledge management is an administrative model for innovation introduced by Nonaka and Konno (1998) in Japan. The model explains how through the constant interaction between explicit and tacit knowledge, companies can benefit by turning what their employees have learned not only through their education, but also through their personal experiences, into learning cycles that promote collaboration and the creation of new knowledge.

Explicit knowledge refers to formal knowledge found in manuals, scientific formulas, policies and books. This type of knowledge is very cognitive, which makes it easier to communicate. On the other hand, tacit knowledge is not easily visible or expressible to others. It encompasses personal experience, feelings and unstructured information, which makes it very hard to communicate. The interaction between these two types of knowledge is portrayed in the SECI Model: spiral evolution of knowledge conversion and self-transcending Process (Figure 2).

The SECI model has four steps that lead to innovation (Nonaka & Konno, 1998). The first, socialization, involves the sharing of tacit knowledge between individuals according to their role. These roles are described in Table. 1. It is made possible thanks to casual conversations, joint activities and any kind of time spent together that involves

physical proximity. The objective is to understand each other's way of thinking and

feeling.
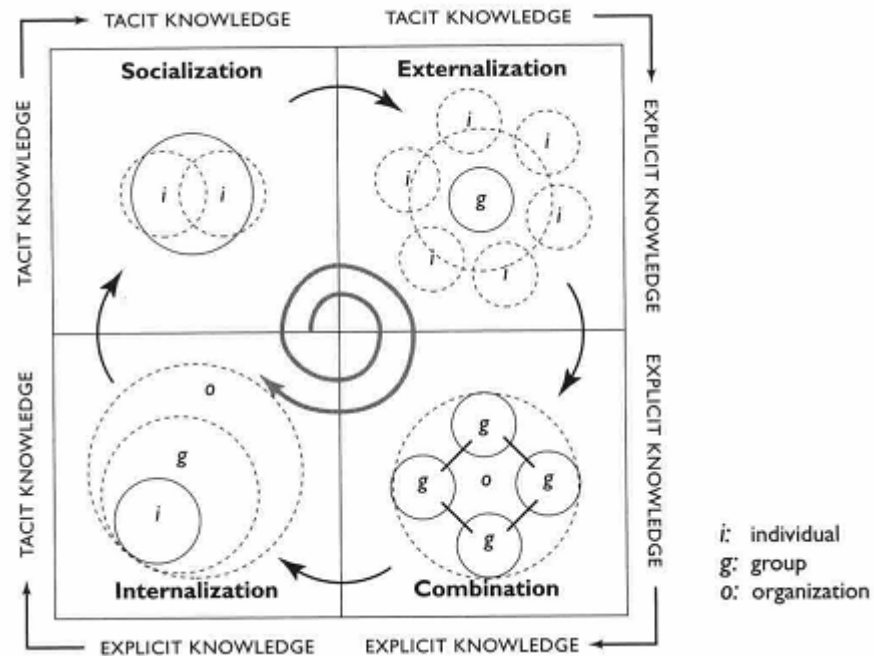
Figure 2. Spiral evolution of knowledge conversion and self-transcending Process.
Adapted from Nonaka & Konno (1998, p. 43).

The second, externalization, is where the tacit knowledge is put into words and

other comprehensible forms for others to receive it. Here, the individual commits to the

group and becomes one with it. Some ways to put externalization into practice is by

expressing ideas in words, images or metaphors.

The third, combination, is when explicit knowledge is transformed into new ways

of explicit knowledge. It can be transferred by gathering information through research or

sharing the knowledge with presentations or reports.

Finally, internalization, is the last part of the cycle. It is when the individual

becomes unconsciously skilled and ready to share the new knowledge in many ways both

tacit and explicit. This is made possible by developing an identity with the group and learning by doing. "There is a process of embodying the explicit knowledge by using simulations or experiments to trigger learning by doing processes. New concepts or methods can thus be learned in virtual situations" (Nonaka & Konno, 1998, p. 45).

Roles in a virtual world

Administrator. This is the person authorized to build or delete items or places in the platform. Also, this person grants permission to possible members that will enter the conversation.

Members. People that can start or attend meetings, import, delete objects and rearrange the objects in a room.

Visitor. A visitor can join meetings but cannot click on any objects. They are allowed to move and to communicate but cannot make changes to the space.

Table 1. Roles in a virtual world

Limitations of the Use of Virtual Worlds in Education

When it comes to the use of the technology, not everyone is knowledgeable on how to use these platforms. Therefore, not knowing how to interact in them can interrupt the achievement of learning outcomes. Therefore, it is necessary to assess in advance how knowledgeable the participants are in its use. People who receive training need to be comfortable using the technology in order to attain the desired learning outcomes. With a group of learners less experienced in modern computing, one to two hours of training in the use of the platforms, creation of accounts and customization of avatars is recommended before content is delivered (Heiphetz & Woodill, 2009).

Often times, one of the problems faced when building meeting places in VW is that designers concentrate on creating replicas of real-world meeting rooms (Heiphetz and Woodill, 2009). Avatars don't need chairs, tables, beds or elevators to interact or move around. However, adding some of these features helps to keep a certain connection with the real world, which lowers the ambiguity that the use of this technology might generate (Bardzell & Odom, 2008; Heiphetz and Woodill, 2009). When exact models of the real world are not required, the builder faces a bigger challenge: if there is a platform that allows them to build anything, what would they build? In other words, Virtual worlds give the user the opportunity to develop not only a physical environment, but also to create an experience that would be difficult to portray in the real world.

Also, the same way traditional classes need evaluation; virtual worlds need to have ways to assess the achievement of the learning objectives. The evaluation of learning outcomes in Virtual worlds is generally a replication of the methods used in the traditional classroom (Chapman and Stone, 2010) such as quizzes and surveys. However, if the main objective of Virtual worlds is to create an immersion experience where the student learns by doing, what should be measured with evaluation is not knowledge but performance. Further research is needed to identify the most effective tools for evaluation in Virtual worlds.

In addition, more research on the effectiveness and outcomes of the teaching of creativity in Virtual worlds is necessary. The few articles that have covered the subject are based on case studies (Uribe Larach & Cabra, 2010; Ferguson, 2011), but quantitative and qualitative research hasn't been conducted yet on the subject.

The Thinking Skills Model

The Creative Problem Solving Thinking Skills Model (CPS/TSM) builds on over 50 years of constant research and refinements (Osbon, 1957; Noller, Parnes & Biondi, 1977; Isaksen, Dorval & Treffinger, 2000; Parnes, 2004; Miller, Vehar, Firestien, et al., 2011, Puccio, Mance & Murdock, 2011) to the Creative Problem Solving framework. The original Osborn-Parnes model was linear. It always followed a process that started and ended the same way. The CPS/TSM, on the other hand, is a descriptive model, which means that it allows the user to move freely in between steps according to the need. In order to make that possible, there is an executive step, assessing the situation, which provides the guidelines to identify where the process should start. It is located at the heart of the model to give a sense of direction to the remaining stages. Around the assessment step, there are three conceptual stages; clarification, transformation and implementation. Each stage is composed of two steps where a dynamic balance between divergent (creative) and convergent (critical) thinking take place. At the same time, each one of them is influenced by specific cognitive and affective skills. Figure 3 shows an integrated Creative Problem Solving Thinking Skills Model with the cognitive and affective skills.

Clarification.

In this stage of the process, the situation is analyzed in order to be understood. The steps that support it are exploring the vision and formulating challenges. In exploring the vision, the objective is to answer the questions: *where do I want to go? What do I want to accomplish?* The affective skill present in exploring the vision is dreaming, which allows imagining hopes and desires as possible. "While dreaming we not only have the opportunity but also face the necessity to look further into the situation"

(Ullman, 1998, p. 91). Dreams also point us in the right direction by acknowledging our strengths and weaknesses and liberating our creativity.

Formulating challenges, is the step where the possible pathways to achieve the desired outcome are identified in order to move forward. It asks: *What do I need to consider to get to my goal?* Sensing gaps is the affective skill that helps one to remain aware of the discrepancies between the current state and the desired state. This skill describes how tacit knowledge is received and processed. One way to develop the ability to sense gaps is by becoming more aware of the one's own intuition, hunches and gut feelings (Puccio, Mance & Murdock, 2011).

Transformation.

This stage is the part of the process where a search for ideas and options to solve a problem is conducted, followed by the refinement of the best ideas into workable solutions. The steps that make it possible are exploring ideas and formulating solutions. Exploring ideas is the search for multiple possibilities or options to solve the challenge. It is lead by the question: *What are my options?* The affective skill that supports the step is playfulness; the allowance to play with ideas and discover new nuances. As described by Russ (1996), "playfulness is the affective component of spontaneity and joy" (p. 40). Brown (2009) described the how playfulness component of toys and games release the impulse to create and encourage divergent thinking.

Formulating solutions is evaluating the implication of an idea; analyzing its positives, potentials, concerns and overcoming those concerns. This evaluation turns the idea into workable solutions.

Implementation.

It is the last stage of the creative process, where the idea is refined and turned into action steps to make sure it becomes a reality. The steps that compose it are: exploring acceptance and formulating a plan.

In exploring acceptance, an evaluation of all the forces that might help or hinder the implementation of the idea is done. The process is lead by the questions*: How to assure success in the context when you already know what you need to do? What are the things around me that will help or hinder how this solution is understood and accepted?* Sensitivity to environment is the affective skill that facilitates the step. It is the ability to remain mindful of the context that surrounds a situation.

Formulating a plan is to identify possible tactics or action steps in order to put the newly refined idea into action. It is possible by thinking*: What concrete things do I have to do to make this happen?* Tolerance for risk is the affective skill that assists in keeping an open mind to accept the possibility of failure and having the ability to manage the emotions when it happens. "The tendency to take risks increases the likelihood that one would engage in behaviors and have experiences that would broaden the individual's knowledge (Russ, 1993, p. 63).

In addition, to these specific skills, there are three affective skills that are present throughout the model: openness to novelty, the ability to embrace wild and unusual ideas that might seem risky or useless; tolerance for ambiguity, being able to cope with the uncertainty of not knowing what is going to happen and to avoid jumping to conclusions at an early stage; and tolerance for complexity, coping with the idea that the process might be challenging, difficult and may include many elements.
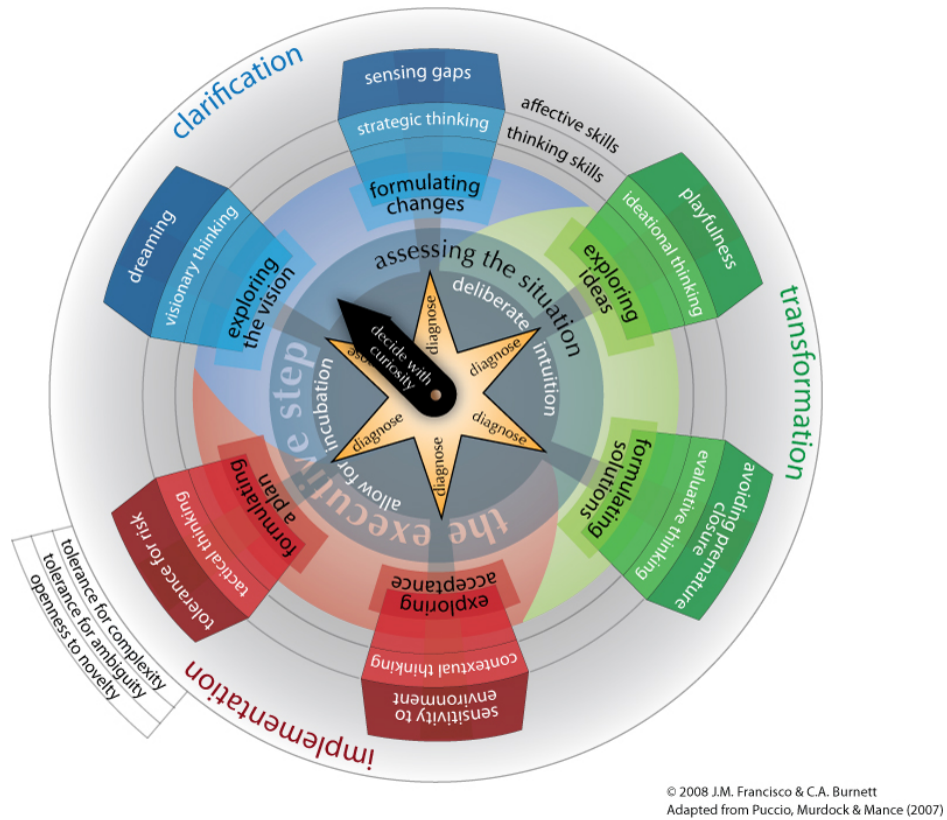
Figure 3. Integrated CPS Creative Problem Solving Thinking Skills Model with the cognitive and affective skills.Adaptation made by Francisco& Burnett (2008) from Puccio, Mance & Murdock (2011).

As mentioned before, each step has a dynamic balance between divergent and convergent thinking. In addition, there should be times for rest. In order to have an effective resolution of the problem and to ensure the search for the best ideas, it is recommended to allow some time for incubation after intense periods of deliberate effort (Davis, 2004; Parnes, 2004). Incubation is a term introduced by Graham Wallas (1926) and it refers to when the problem is being worked on in an unconscious way. In other words, is taking a break from the main task. An example of incubation is the fact that many people get their greatest ideas in the shower. Other ways to incubate are talking a walk, visiting new places, changing activities or discussing unrelated subjects to create

remote associations. On the emotional side, the use of intuitive tools such as meditation, walks in the woods, walking a labyrinth, drawing, and making collages, among others (Bisset, 2008; Burnett & Francisco, 2010), promote incubation.

Currently, the creativity preferences assessment FourSight (Puccio, 2002) has been the framework for teaching CPS/TSM. The measure assesses personal preferences in the creative problem solving problem. It highlights four profiles that relate to the stages of CPS/TSM: Clarify, ideate, develop and implement. Since the fall 2010 semester students of the program have taken the measure to identify their personal preferences, while they relate them to the steps of CPS/TSM (see Appendix B). The assessment includes a color-coded report with the results. In it, each one of the preferences is identified by a different color: blue for clarify, which connects to the exploring the vision and formulating a challenge steps; orange for ideate, that refers to exploring ideas; green for develop, that links to formulating a solution and pink for implementation, which represents the steps of exploring acceptance and formulating a plan. These colors will be incorporated in the use of virtual worlds, to promote a better understanding of the activities and tools related to each step of the process (Figure 4).

The FourSight framework has made the teaching of CPS/TSM very approachable. It has also helped to reinforce the fact that the teaching of CPS/TSM is life changing. It not only allows people to find creative resolution to their problems, but also changes their attitude when the process is practiced repeatedly. "They seem to become more open to ideas; they also seem to appreciate and have a greater deal of respect for their own knowledge" (Parnes, 1992, p. 134). It also encourages creativity as a result of the interaction between thinking and emotion (Puccio, Mance & Murdock, 2011).

clarification

dreaming

sensing gaps

curiosity

tolerance for risks

playfulness

exploring the vision

formulating challenges

decide

gather data

formulating a plan

exploring ideas

assessing the situation

implementation

exploring acceptance

formulating solutions

transformation

sensitivity to environment

avoiding premature closure
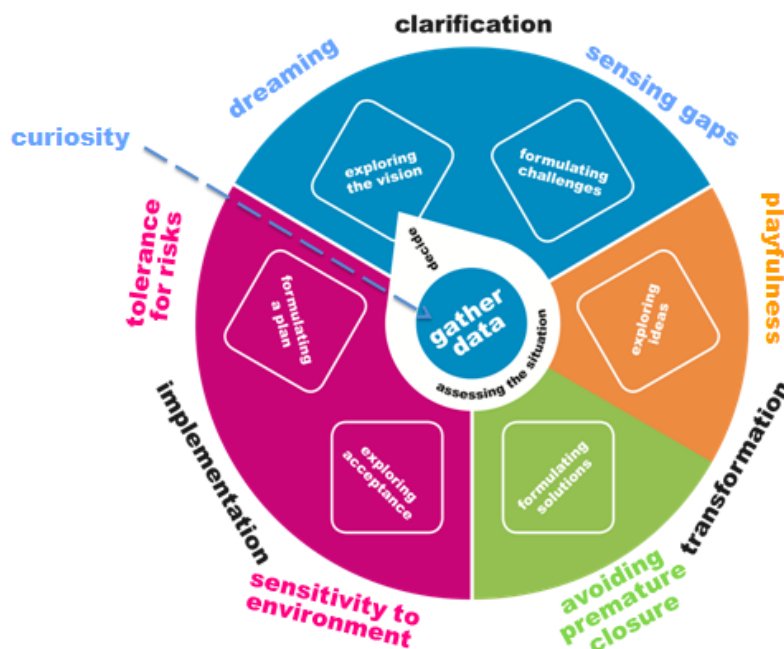
Figure 4. The affective skills in the Creative Problem Solving Thinking Skills Model. Adapted from Nielsen &Thurber (2010), based on the work of Puccio, Mance & Murdock (2011).

Using technology to teach creativity

This project is a prototype of a virtual world where creativity can be encouraged through distance learning. Technology has permeated every aspect of our lives. For instance, education has to take it into inconsideration or students won't be ready to face the demands of fast changing environments. Virtual worlds are spaces that allow for a consistent interaction between tacit and explicit knowledge, given that they provide spaces to connect, interact and learn by immersion. Also, given that the affective skills come from tacit knowledge, delivering creativity courses in these platforms can leverage the learning of the affective skills. Nevertheless, there are some barriers that need to be considered when designing educational programs in these types of environments.

The biggest issue education faces with the use of virtual worlds, is that sometimes the experiences are not considered as real (Twining, 2010). It mainly has to do with the fact that they are compared to video games, and its play component is not considered useful in the learning process. However, the playfulness of games can be a serious matter where the player engages completely in the activity (Huizinga, 1950; Brown, 2009), increasing the learning and facilitating its application in the real world. According to Uribe Larach and Cabra (2010), Virtual worlds provide a better experience than other distance-collaborating tools. Also, research has shown that people do feel and behave very similarly in virtual and physical worlds (Bardzell & Odom, 2008).These immersive simulations encourage flexibility (Heiphetz & Woodill, 2009) for both learners and instructors, since they are more in tune with descriptive types of learning.

Virtual worlds are opening new possibilities for education to promote collaboration. However, "only supplying different types of communication tools in e-learning does not guarantee students' interaction with each other and with teachers if they do not feel any need to do so" (Özdemir, 2008, p. 554). The tools used in virtual environments need to focus not just on the literal building on the spaces, but on developing emotional, personal and meaningful spaces for the learning. It is in meaningful spaces where creativity is more likely to emerge (Uribe Larach & Cabra, 2010).

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Section Three: Process Plan

There are two phases to this project. The first phase involves the creation of a space, inspired by the affective skills, to deliver the class CRS 559: Principles of the creative problem solving. This process took place during the course of an academic semester from September through December 2011. The second phase will be the utilization of the room by Dr. John Cabra, who will be in charge of delivering the class in the spring of 2012. This is considered as a second phase because during the utilization of the virtual environment some changes might need to happen in order to have satisfactory learning outcomes.

Marie Mance, Dr. Cyndi Burnett, Dr. John Cabra, and Andy Burnett (ICSC Alumnus and Managing Director of Knowinnovation Ltd) served as mentors by providing their guidance and technical support through the process. Since the objective of the creation of the rooms was to be able to use them in a real educational setting, some meetings were scheduled with the goal of having a common understanding of the needs and usability of the space. These meetings were conducted both in a face-to-face manner and in OpenQwaq.

At the beginning of September 2011, Andy Burnett (personal communication, September 18, 2011) provided a pre-designed space to build the virtual classroom. It took several weeks to get accustomed to it, which delayed the originally proposed deadlines.

Also, the pre-made elements offered in the object catalog were limited to boards, chairs, tables, plants and options to load posters or signs. Given my lack of 3D modeling experience, it was going to be challenging to build all the things that I had imagined. The situation was confusing and frustrating. Therefore, in order to further clarify the situation

and understand what my limitations and capabilities were, a lot of the initial time building was spent going through instruction manuals of the platform and playing with the different options and configurations offered in OpenQwaq: In other words, becoming familiar with it.

To explore possible ideas, a brainstorming session was scheduled with distance students that are currently taking classes using OpenQwaq. The session was organized by Dr. Cyndi Burnett and it lasted an hour. The participants that attended were two students and two faculty members. After introducing the project goals, many ideas were generated. The session was very helpful to decide on the next steps to accomplish. It was also a good opportunity to experience a live session in the platform and to assess its capabilities and flaws.

After all the valuable feedback, an intense exercise to converge the ideas was conducted using an evaluation matrix. The criteria were: things that were doable, that looked aesthetically pleasing, that were related to the specific affective skills, that could support the Creative Problem Solving Thinking Skills Model (CPS/TSM) and that were easy to use or identify.The brainstorming exercise continued beyond the session, when the room remained open for other students to visit and add their ideas to the boards.

Along the way, multiple technical difficulties were encountered such as problems to log into the platform, computer crashes and my lack of knowledge on how to use some of the tools. These obstacles delayed the process and didn't allow me to follow the timeline as it was proposed. Therefore, the spaces developed will serve as prototypes and guides for the continuity of the project in the future.

Those delays weren't estimated on the proposal's timeline, the reason why the project wasn't completed as it was originally intended. Here is how the final timeline looked:

Activity	Hours	Deadline
Write proposal	5	September 14th
Proposal corrections	3	September 18th
Proposal approval	3	September 22nd
Training session (was scheduled but didn't happen due to technical difficulties)	1	September 25
Interview with Dr. Cyndi Burnett	1	October 6
Interview with Dr. John Cabra	1	October12
Sections 1, 2 and 3 write-up	40	October 20
Coffee talk session in Teleplace with current distance students	1	October 20
Rooms building	30	November 8
Feedback from instructor	1	November 9
Sessions 4,5,6 write-up	15	November 17th
Section 3: Process plan	1	November 19
Corrections sessions 1,2,3	4	November 23
Write Conclusions and abstract	5	November 29th
Section 7: Appendix and bibliography	2	November 30th
Feedback from instructor	1	December 2
Presentation	3	December 1st
Final write up	8	December 8th
Signature	3	December 15th

Section Four: Outcomes

If you could have the possibility to build anything, without time or space constraints, what would you build? This was the most interesting, yet most challenging question faced during the construction process. It required the use of creative thinking skills, mindfulness and, most of all, patience. When thinking about a space to deliver creativity training in virtual worlds, the first ideas to arrive were related to walls, floors and roofs. But what if none of this is necessary? What if the floor could float? What if you could stick post-its and all sort of things from the air without using any walls? What if you could walk on top of the water or fly to move from one spot to the other? The previous questions are an example of how virtual worlds encourage flexibility of thought, imagination, tolerance for risk, and playfulness. This chapter presents a description of the creativity classroom that was built and the ideas generated and executed.

The original space that was given to me looked like an island with trees, a boat and three floating circles (Figure 5). The first reaction was disappointment. How could you possibly build four rooms in such a small place? At that moment it was very difficult to imagine that the water was also a workable space as avatars can walk on top of it and that the circles were actually working areas set up with boards where post-its, documents and PowerPoint presentations could be added.
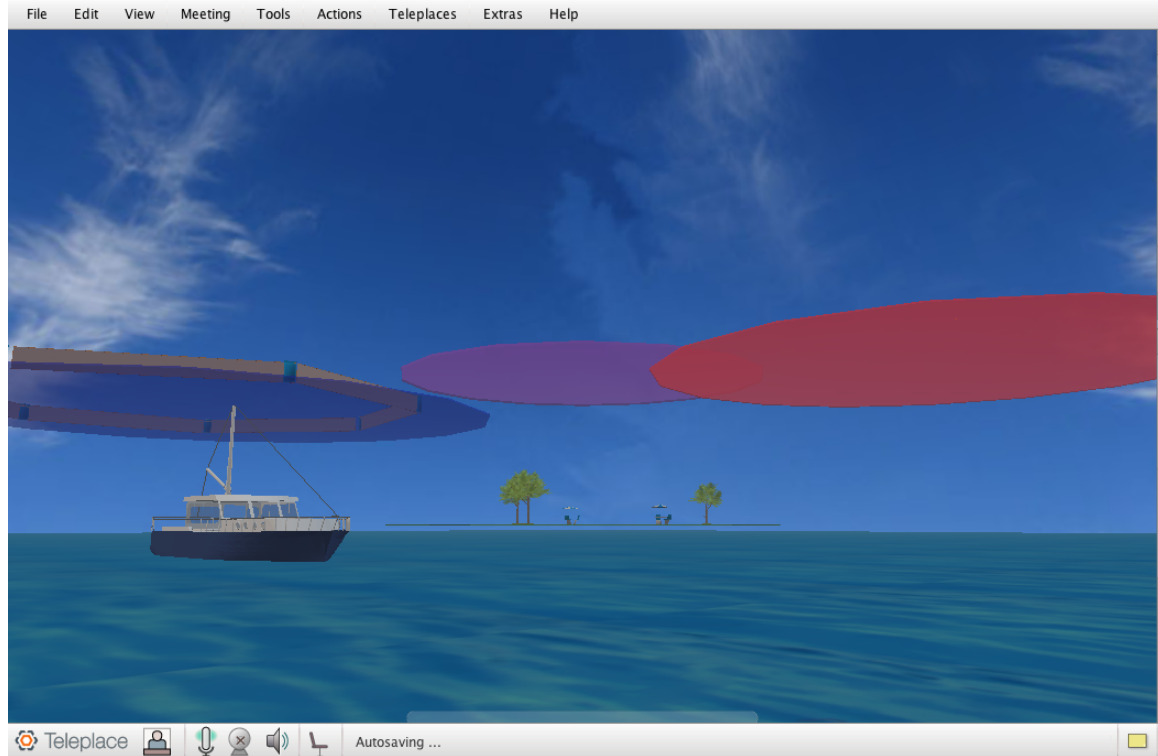
Figure 5. Original island design.

The brainstorming session with the distance students resulted in many useful

ideas that inspired the implementation process (Figure 6). After the convergence process

was done and the main ideas to be used were identified, the energies were focused on

developing the space. In order to transform the space given to make it fit with the needs

of the creativity course, multiple attempts to change the configuration of the room were

made without any satisfactory results. For instance, a completely new space was started

from scratch to facilitate the customization process.

A tool that facilitated the conception of this new place was Google SketchUp, a

free open source software for 3D modeling that includes a virtual warehouse where

people share their creations in a Google-sponsored website (www.sketchup.google.com)

so that other users can download them for free.
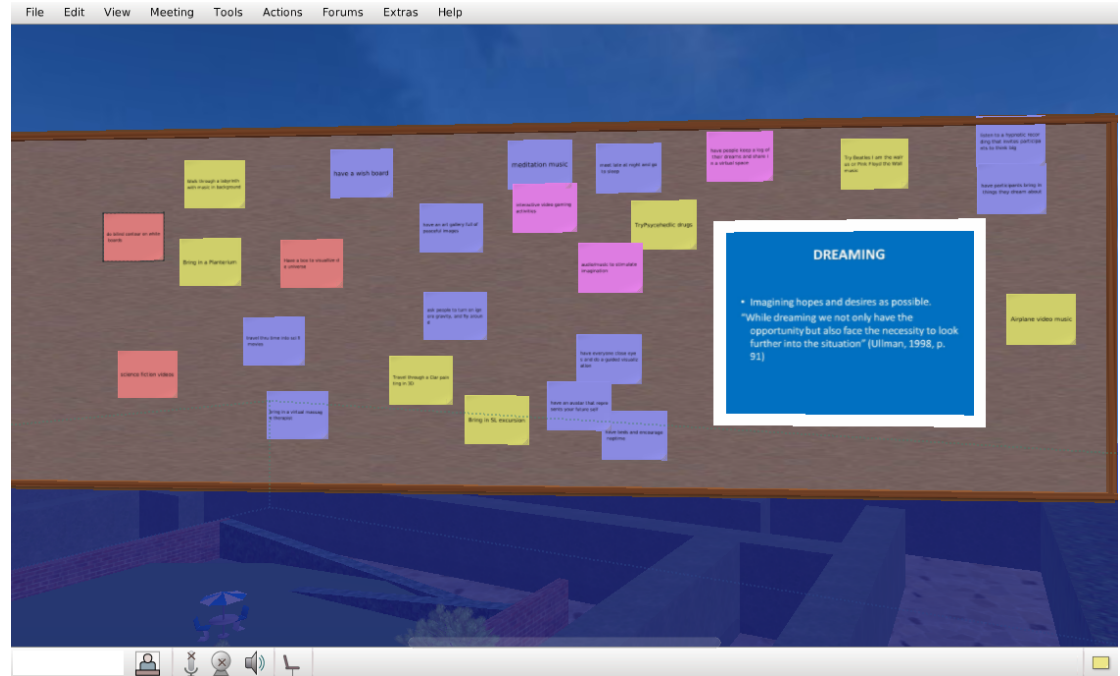
Figure 6. Board where the brainstorming session took place.

The new space was divided into five different levels. The ground level is where all the places related to incubation are located. In the sky, four hexagons, color-coded with the FourSight colors, float around the elements on the ground level. The distance between the hexagons and the ground differs according to the stages of CPSTSM. That way, the clarification space, in blue, is the highest since the action calls for dreaming and using imagination, in other worlds, for detaching the self from reality. Opposing that stage is implementation, in purple, which is the closest to the land, as a metaphor for the ideas that are becoming a reality and being brought on solid ground.

The first thing that was laid out on the soil was the sea. This idea came from the original model and was kept due to the relaxing qualities of water, which can promote a state of mindfulness. On top of the water, a labyrinth (model taken from Google SketchUp) was located. This idea was inspired by Janice Francisco's (2006) book *A*

Creative Walker's Guide to the Labyrinth: An Approach for Beginners, where labyrinths are recommended as incubation and self-reflection tools. They are also great tools to manifest tacit knowledge, allowing insights to occur. The labyrinth chosen is squared and not rounded as most labyrinths are (Figure 7). This should facilitate the movement of the avatars in it, since the transportation from one place to the other is mainly done in straight lines. At its center, there is a garden with a pool and a bench where avatars can sit to relax and enjoy the view. Also, as suggested by one of the distance students during the brainstorming session, an option to print a finger labyrinth is located in the garden, which will allow students to put the labyrinth in front of them and walk it with their fingers, providing a relaxation time away from the computer screen (see Appendix D).
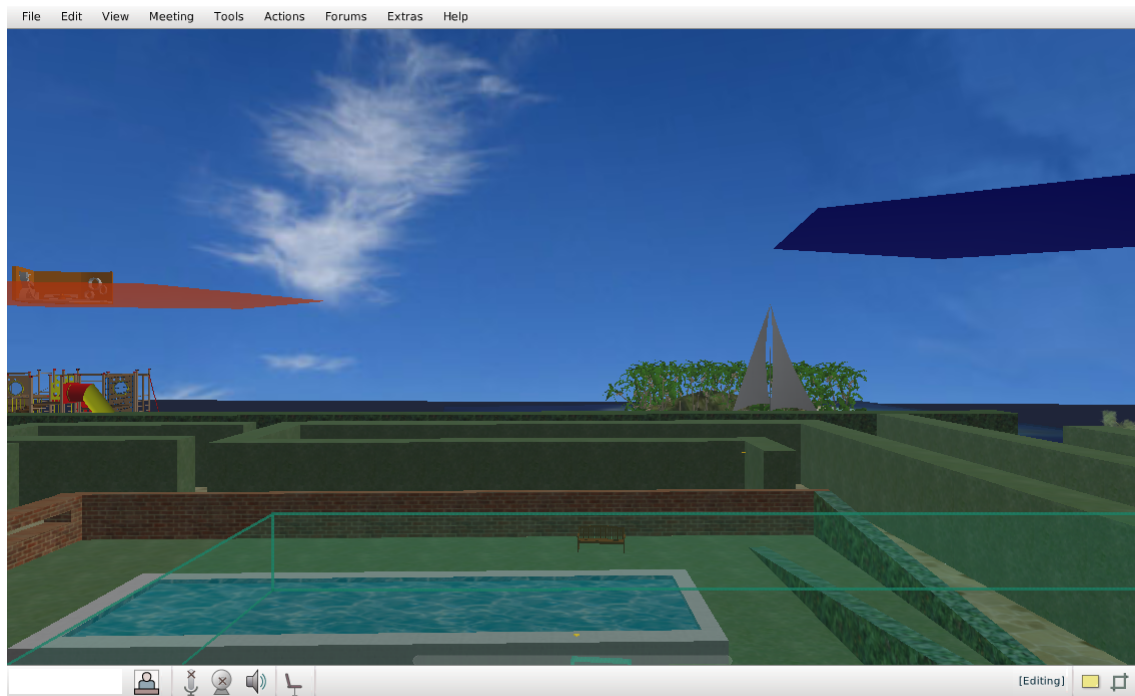

Figure 7. Labyrinth as seen from the inside

Multiple spaces were added for incubation, but they also serve as meeting spots to work in groups. This is particularly useful when the instructor decides to break the group

into teams to work on a specific challenge. Group activities are essential to promote interaction between tacit knowledge and explicit knowledge, a process known as socialization (Nonaka & Konno, 1998). A technical advantage of having multiple meeting areas is that avatars can interact in semi-private spaces where the members can be seen by others, but their conversations can remain unheard by the use of private chat or audio settings, or by adding sound-blocking walls. This last feature is a configuration offer by OpenQwaq that works like walls do in real life, helping conversations to be kept out of the reach of those who are not in the limits of the walls.

Another incubation space is an island. It includes a beach with palm trees, white sand and grass, clear water and a boat. This place can be walked by the avatars and could be very effective in supporting dreaming activities such as walks in the woods; activities promoted by Sidney Parnes (2004) as a way to encourage the use of imagination. Since dreaming and visioning are activities related to the clarification stage, a blue hexagon floats just above the island. This FourSight color-coded hexagon will be the space to deliver all the content related to the clarification stage. The details of this floating space hadn't been added as of the culmination of this project.

Parallel to the island there is a playground. This is located below the orange floating hexagon assigned to the ideation stages of the process. It is can serve as a meeting space, but it also goes in accordance with the affective skill of playfulness. It works as a visual cue that allows members to make connections with games, a playful attitude, or even their own childhood. Given that the orange platform is clear, students can see the playground during the ideation activities, which could also work as a tool to make remote connections to the challenge that is been worked on (Miller, Vehar,

Firestien, et al., 2011). The ideation space was still under construction at the culmination

of the project, but is expected to be finished before the beginning of the spring semester

in 2012.

The spaces that serve as prototypes were the developing and the implementation

stages. Both of them have common and specific features. The common features are a

conference table, an inspiration corner and boards and displays where presentations,

documents and post-its can be placed. The conference table (Figure 8) is located in the

middle of the hexagons and it serves two purposes; the first is a meeting spot were

avatars can sit and see each other, and the second is a connection with real world objects

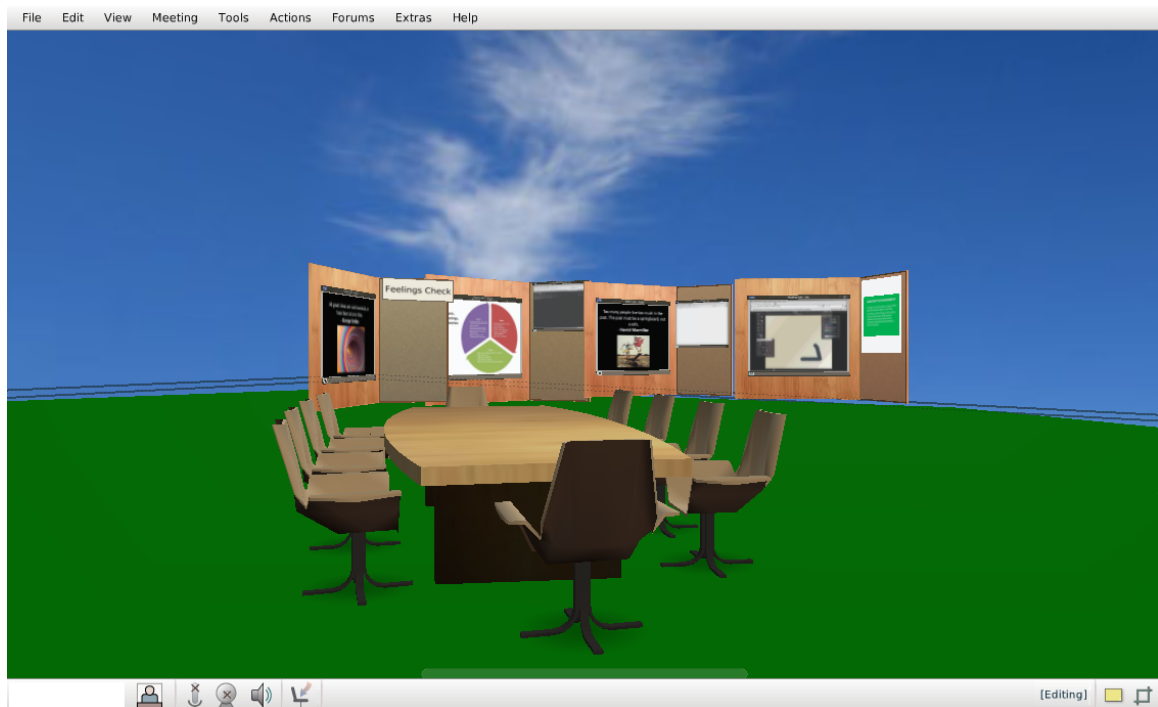as suggested by the literature on education in virtual environments.

Figure 8. Conference table and inspiration corner

The inspiration corner is a wall of four panels that includes screens and corks.

They provide the classroom with an opportunity to externalize tacit knowledge (Figure

8). In them, participants can share their thoughts, quotes, links and other elements from

their personal and professional lives that support the specific affective skills for each stage. It is also a great place to leave ideas or post questions that are not strictly related to the content of the class, but that can be approached and answered at a different time. In the creativity classes at the International Center for Studies in Creativity this action is widely spread and is known as the *Parking Lot.* In order to motivate first time members to add to them, some quotes, links and tools were added to each one of the panels.

Development space and the sensitivity to environment

The developing stage is represented by a green hexagon. Since the affective skill promoted in this part of the process is sensitivity to environment, the items added to the inspiration corner aim to encourage members to be mindful of the different aspects of a challenge, to resist making a rushed decision, and to keep novelty alive as they converge on ideas. The panels have posters with quotes that promote sensitivity to environment for example: "Too many people live too much in the past. The past must be a springboard, not a sofa" – Harold Macmillan.

The quotes were taken from Joy of quotes (2011), a website developed by Creative Studies alumna Marta Ockuly. In addition to the quotes, the panels include a poster with the definition of the affective skill previously mentioned. Another poster lists some recommendations to be sensitive to the environment (See Appendix C).

Some website links were also added. The first is website that allows visitors to draw. This will allow students with visual learning preferences, to approach their challenges and ideas generated by the use of drawings and designs.

The second is a website that displays 360 degree photos of famous cities (www.360cities.com). The last one is a link to Google Art Project

(www.googleartproject.com), a place that offers 3D visits to famous museums in the

world and even allows explorations of the inside of their paintings. Both websites could

be used to do different environment observation exercises.

Sensitivity to environment was also encouraged through the use of the intuitive

tool: facts, feeling and hunches (see Appendix E). The last addition to the inspiration wall

is a feelings check wall. It can be used during classes to be aware of the mood and energy

flow of the group as the class goes on. All these resources serve the purpose of inspiring

new behaviors and ideas. However, their utilization can be modified and their content can

also be deleted or changed any time the professor considers it necessary.

Implementation space and the tolerance for risk

In order to promote the tolerance for risk, a poster, a website link and four quotes were

added to the inspiration corner. The poster is a list of exercises suggested to make the

affective skill a life habit (see Appendix C).

As for the link, it takes members to the video *Honda: The power of dreams.*

Failure: The secret to success. The video is a documentary of testimonials from leaders

in different industries that found success by embracing failure as a learning opportunity

in their lives. In addition, some quotes were also selected such as: "to try to fail is at least

to learn; to fail to try is to suffer the inestimable loss of what might have been". - Chester

Barnard. Figure 9 shows how the quotes are displayed in the panels.
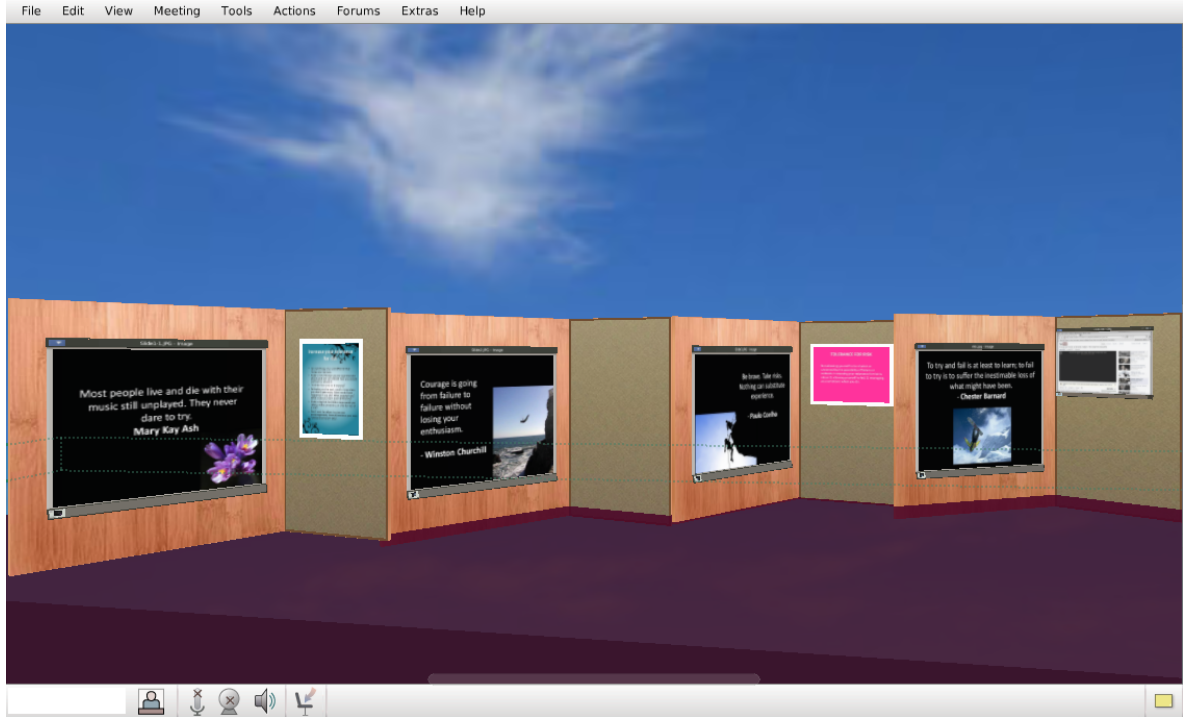
Figure 9. Implementation inspiration corner

The different spaces are still a work in progress; several tools have been developed and added to the scene to facilitate the focus on the affective skills. However, it will be during the classes that this platform will come to life and will be transformed in accordance with the group needs.

The building process was a fun, yet challenging, task that prototypes a space with tools that facilitate the teaching of creativity content. The tools emphasized the affective skills by providing inspiration and guidelines on how to develop the different skills to create positive habits. The process is not finished and will require continuous improvement and change, since the most important thing to remember is that this space, in order to be useful, must fit the needs of the incoming class.

Section Five: Key Learnings

This Master's project has given me the opportunity to learn more about my own creativity, motivations and problem solving preferences. The end product has reassured me that I am a creative person and that it is important to stay mindful of the process to avoid stagnation when different obstacles arrive.

Process

From the beginning, this project was an exciting journey that allowed me to challenge myself and to link the intuitive tools, which I value so much, with the teaching of the Creative Problem Solving Thinking Skills Model (CPS/TSM). It motivated me because it gave me concrete tools to connect with many people around the world, and because it gave me hope to start teaching creativity in Latin America without having to end my journey in the United States.

I wanted the process to be very intuitive since one of my goals was to pay attention to my own emotions throughout the process. Initially, it was a difficult task to accomplish, since I was looking for perfection and got caught up in elaborating too much. However, when I stopped thinking and allowed myself to feel more, simple and --what I consider clever-- ideas started arriving. All I needed to do was to give myself permission to play, to make mistakes and to go back to basics. When I started using the intuitive tools to understand my own process, the clarity about the affective skills emerged. I discovered that the core of this project was meant to inspire, to empower, and to encourage action, the same reasons that brought me to the Creative Studies program in the first place.

Although I didn't meet the deadlines that I had originally planned and couldn't finish building the four rooms, this process was a great learning experience about thriving, being flexible, and trusting the moment. From the beginning I experienced multiple technical difficulties, but I didn't give up.

In fact, those obstacles sparked new ideas and turned the project in a new direction that I had never expected. At the end of the day, it all came down to simplicity. I didn't need to sign up for 3D modeling classes to create over-the-top designs or spectacular rooms that nobody had thought of before; all I needed was to play to my strengths and find the resources necessary to support me along the process. For that reason, I looked for my own inspirational resource collection, and placed some of the items found where they could be openly shared with others. It all comes down to Teresa Amabile's (1998) intrinsic motivation theory, where she explains that the best way to find one's creativity is when there is a combination of passion, knowledge of the task, and a supportive environment.

About the process, I learned that the best way to have an understanding of the affective skills is by being in touch with one's emotions. That means that it is a personal journey that cannot be forced or rushed. For instance, the best way to encourage the affective skills is by raising awareness of its importance and to provide tools to motivate discovery path. Especially when referring to virtual worlds, I came to understand that people don't need to smell the grass, touch each other, or have an avatar-mediated yoga session to connect with their inner selves. They can do exercises in their everyday life and come back to class and share them back with others to increase the knowledge. It is

what Nonaka and Konno (1998) have labeled as the combination stage in the knowledge management process.

I also learned a lot about CPS/TSM, although I had been constantly reviewing it for the past year. My natural tendency to solve problems is to think of ideas and to start implementing them without understanding the situation in depth. This project proved to me that moving too fast into generating ideas, without understanding what the capabilities for the solution are, is usually not the best move. Also, it demonstrated that CPS/TSM is a descriptive model that allows going through the stages without any particular order. In this case, I started exploring ideas by playing with the platform and trying to build things without having a background. Then, when I was formulating solutions, I discovered that things weren't working well. This took me to explore the challenge by digging in the literature and by understanding the underlying reasons that were driving my energy towards the project. The next step was to explore ideas again with a group of distance students, followed by formulating a solution and formulating a plan. Thanks to the mindfulness kept on the different stages, now I feel more confident in the use of and my ability to teach the model.

Content

I learned that even when there are multiple attempts to incorporate computers in the classroom, technology doesn't work by itself. It needs to be supported by different strategies in order to be effective. Specifically talking about virtual worlds, just bringing people together won't make them feel connected, even if it will enrich their experience through the use of different learning style approaches that simulate real classroom environments.

Virtual worlds provide users with an immersive experience that can help the learning process. They work better when they are combined with experiential activities and opportunities to apply the learning in real environments. They are a great attempt to provide safe ways of practicing what is being learned as well as allowing students to go back to review information and relive the experience, without having to physically meet with the instructor or classmates. When it comes to creating and experimenting with different atmospheres, the limits to the imagination are endless. However, the slowness of the software, the delays in the communication and the lack of technical expertise are factors that hinder learning and creativity as well. Also, I learned that even though OpenQwaq is user friendly, it still takes time to learn how to use its features and the different building tools.

To deliver sessions in the platform, the instructor must make sure that all participants are using the same version of the software. I learned this after wasting almost twenty minutes of the brainstorming session with distance students because I needed to update my version to match theirs in order to access the room. In addition, the slowness of the software can generate frustration and sometimes misunderstandings when the audio is delayed.

Nevertheless, some tools were very useful in conducting the session. The first one was the possibility to lead the meeting. The leader of the meeting can lock the view of the participants, making sure that they are all seeing the same spot at the same time. This comes in very handy, especially when dealing with big spaces where there are many things to see and multiple chances to get lost. Another good feature was the use of video feeds, which allowed participants to see each other via webcam, providing the platform

with a higher feeling of face to face interactions, beyond that of an avatar "video game" experience.

At the end of the session, there was a time for discussion and feedback. On the positive side, participants liked some incubation features that were added. As for opportunity for improvement, they felt that the space was too big, which made it confusing to navigate and to follow the conversation. Also, students agreed that even though the use of virtual worlds in the classroom has been very useful to increase interaction and to demonstrate other facets of each other's creativity, when activities take place in an asynchronous way, there are still many feelings of solitude, as the chances to see someone else visiting the space at the same time are very low. Something that was surprising during the session was to see how students related the affective skills not with visual cues, but with actual tools and activities related to them. For example, for the affective skill of dreaming, some of the ideas suggested were to have an art gallery full of peaceful images or to play meditation music.

I also discovered the application Google SketchUp that, in my personal case, were a savior during the process. It is a great example of a collaborative environment where people create and share with the world. This was a great tool, but if I were to do this project again, I would be more cautious with its use, since it crashed my computer multiple times and also made the experience in the platform even slower. I will always remember that the richer the graphics, the slower the connection, which means than with Google SketchUp, it is better to choose the simple over the elaborated models in order to avoid problems. Also, for the record, when talking about height in OpenQwaq, the

distance of the objects shouldn't exceed 10 feet from the ground. Otherwise, the objects won't work or avatars won't be able to interact with them.

In addition, I increased my knowledge on different tools and features that help to provide richer experiences in virtual worlds such as reading non-verbals by the movements of the avatars, and by paying attention to the video feeds; using walls to block sounds; and leading the meeting to keep everyone on the right track.

On the other hand, I became aware that just by visiting a room it is very hard to become deliberately conscious of the affective skills if the learning is not supported by real experiences that tackle one's emotions. Also, when it comes to teaching the affective skills in CPS/TSM, there are many resources with practical exercises to learn the skills. The challenge is that often times they aren't called affective skills but experiential, visionizing, or simply creative exercises.

Finally, the project showed me that some social protocol needs to be established for the use of virtual environments, specifically regarding privacy. The International Center for Studies in Creativity is currently delivering a class in OpenQwaq and the students were provided with a space to create their own offices. These offices were originally open to everyone to see, but when they noticed that I was also having access to the platform, some of them weren't feeling comfortable, knowing that a stranger was able to access their office and information without them being present. The same goes for me; it was very awkward to realize that while I was building, anyone could come in and see my creation in progress. I even received emails from students with feedback on some of the new additions. Even when the messages were very positive, it made me somewhat self-conscious of everything that was left there unfinished. When Dr. Cyndi Burnett

noticed the discomfort of the students, she restricted my access to only the common rooms of the Center. This shows that some restrictions should be established when dealing with a large group that is constantly sharing information.

The learnings for both the process and the content were very valuable and they answered the questions that I had posed at the beginning of the project. I became aware of how to teach creativity in virtual worlds, found ways to visually encourage the affective skills, became more comfortable with the CPS/TSM and found a new way to ignite creativity through the use of technology.

Section Six: Conclusions

Through this process, I was able to link my knowledge of creativity to innovative alternatives for distance learning. By combining my interest for technology with my passion for inspiring others, I have developed a prototype of a virtual environment where the teaching of the affective skills of CPS/TSM might be possible. It was a real proof that creativity is driven by motivation and that the affective skills are a result of mindfulness.

The process encouraged me to apply my creative problem solving skills to a real challenge, while I became deliberately aware of the steps and the affective skills in the process. The process was very intuitive and based on my personal preferences of learning and approaching challenges.

Given that the project is a prototype, the next steps will be focused on the completion of the building of the spaces and on conducting trial sessions with Dr, John Cabra. This will allow me to identify changes or modifications necessary before the platform is launch for its use in the spring 2012.

For the completion of the Clarification stage, some of the ideas considered are the addition of a tree where students can write wanders or questions they have to encourage curiosity, quotes from Walt Disney calling for the use of imagination, the use of relaxation music for guided visualization and an art gallery with peaceful images. Also, I would encourage the instructor to ask students to turn off the gravity feature and make their avatars fly during the sessions.

As for ideation, I will explore the use of vibrant colors and visually stimulating photos to make remote associations. Also adding geometrical figures that can also be

picked by avatars, spread across the hexagon, to use as toys or as building blocks during class.

Once all these ideas are executed, my vision is to see people from different cultures learning from each other in a playful way. Also, I am very interesting in following the evolution of a study that will be conducted by Dr, Burnett on the similarities and differences of taking an introductory creativity class in a virtual environment and in a real classroom. This research will be conducted in the spring 2012 and this project will be used as part of it.

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Appendix A: Concept Paper

Experiencing the Thinking Skills Model in virtual worlds

Name: Juliana Sánchez Trujillo   **Date Submitted:** October 10, 2011

Project Type: Using virtual technology to teach the Creative Problem Solving Thinking Skills Model

Section One

Purpose and Description of Project:

The project intends to portray a new way to understand the Thinking Skill Model (Puccio, Mance & Murdock, 2011) through the use of virtual technologies. It will include the design and construction of four rooms inspired on the affective skills of dreaming, playfulness, tolerance for risk and mindfulness. These rooms will be built in the space the International Center for Studies and Creativity holds, in the virtual project Openqwaq, based on the OpenQwaq technology platform. They will be used to deliver the class CRS 559: Principles of the Creative Problem Solving Process starting in the spring of 2012. OpenQwaq is an online collaboration platform that provides a virtual gathering place where people find tools, data and interactivity necessary to work as a group without having to physically be together. The International Center for Studies in Creativity is currently using it to deliver the class CRS 625 for distance students of the Creative Studies Master's program. It complements the use of Buffalo State's platform Angel by giving more flexibility and interactivity to the classes. For purposes of the project, ICSC has provided me with a wide open space where I can build a space that supports the learning of the Thinking Skills model. It will be available for ICSC faculty to use, and they will grant access to the students that will be taking the class.

The space will be divided into four rooms in order to emphasize different affective skills. The rationale behind the affective skills chosen is merely based on the stages of the Thinking Skills Model: mindfulness is a central piece of the process because it allows deciding where to start and how to do it; the skill of dreaming supports the clarification stage, playfulness stands for the transformation stage and finally tolerance for risks represents the implementation stage of the process.

The process is going to be practical and based on collaboration. I will host meetings with distance students to hear their ideas on what they think the different affective skills will look. After the construction is finished, they will help me assess and improve the usability of these spaces.

The biggest challenge of the project is to decide how these rooms should look. According to Heiphetz, and Woodill (2010), training in virtual spaces stops being effective when the virtual rooms are just a plain copy of the physical rooms that already exist. That is why the process will demand a great amount of creative thinking, because I need to detach myself from the traditional classroom and imagine new possibilities with what this virtual world has to offer.

<div align="center">**Rationale for Selection:**</div>

On a personal level, technology has permeated every area of my life. This became very clear to me when I moved from Colombia to the United States of America. For the past year, I have maintained relationships with my family, friends, and colleagues at home through Internet. Something I have discovered is that even when the use of applications such as Skype allow me to communicate in the closest "face-to-face"

possible, it still limits interaction, especially when attempting to share what I have learned in the Creative Studies program.

On the educational level, I arrived to the Creative Studies Program when the transition from the Plain Language model to the Thinking Skills model was taking place. This created some confusion on my understanding of the Creative Problem Solving process. For that reason, I want to use this project as an opportunity to strengthen my understanding of the TSM model and what better way to do it than to explain it in my own words.

Also, I have been fascinated by how the International Center for Studies in Creativity hosts a Distant Master degree in a science that I consider is build on social interaction. Also I recognize and want to be part of the efforts the faculty has made to move into technological and a more dynamic ways to deliver the content. Heath and Heath (2010) explained that the only way change can happen is when head and hearth are fully convinced of the rational for change. With CPS, we emphasize the thinking skills, the ways to help our brain produce some creative thinking and the metacognition necessary to have awareness of the process. However, I still feel that even though approaching challenges with creativity techniques is very effective and empowering, it doesn't assure that the change is going to happen. Sometimes people rationally understand what the problem is, have new wonderful ideas to overcome it, but still don't feel the drive to put it into action. Here is when the affective skills take place. They help coping with the ambiguity and fear that change can produce. We cannot leave the power of affect behind or just mention it on the sides. It is necessary to experience it to become fully aware of its power. This is the reason I personally feel so driven to

provide the experience where people can learn the cognitive side of CPS while feeling the intuitive side of it.

The bridge that links both levels is my passion for training and facilitating creativity, for learning about different cultures, and for helping people in need through creative thinking. The creation of these rooms will allow me and the International Center for Studies in Creativity to reach many individuals and to connect them through a platform that can be accessed anytime from anywhere. In a space that praises the affective skills as it engages people in the thinking skills of the Creative Problem Solving Process.

Section Two

Pertinent Literature or Resources:

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action research study. *Creativity and Innovation Management, 19* (2), p. 167- 179.

Section Three

How Do You Plan to Achieve Your Goals and Outcomes?

To achieve my goals, the first and most important step is to become familiar with the

OpenQwaq platform; how it works, the possibilities it gives, the quality of the connection

and the size of the space available to build the rooms. This will be possible thanks to the

guidance and help that Dr. Cyndi Burnett, Dr. John F. Cabra and Andy Burnett have been

providing me.

The project takes over the research conducted by Uribe Larach and Cabra (2010),

who reflected on the effectiveness of CPS facilitations in the virtual platform Second

Life. These facilitations combined the use of a shared space in Second Life and the digital

collaboration tool GoogleDocs. It was a good exploration exercise but it unveiled the

steep learning curve needed to be able to comfortably use Second Life and the difficulties

of staying focused while working in two different platforms at the same time. As a

consequence, this project is expected to carry on their beginning efforts and follow the

recommendations provided by the authors on this matter.

On the other hand, the literature review will provide me with a broader

perspective of the implications of using virtual worlds in educational and training

programs, the importance of the affective skills on CPS and how virtual spaces can affect creative press.

In addition, I will commit myself to work on the project ten hours a week, balancing the literature review with the construction time. My mantra will be *elaborate but not excessively*. Also, I will reach out for help and feedback from my teachers and classmates in ways to improve my project.

Projected Timeline:

Activity	Hours	Deadline
Write proposal	**5**	**September 14th**
Proposal Approval	1	September 18th
Corrections proposal	3	September 22nd
Section 1: Background to the project	**5**	**September 28th**
Coffee talk session in OpenQwaq with current distance students for suggestions and ideas to build the rooms	1	October 12
Section 2: Literature review	20	October 16th
Section 3: Process plan	5	October 19th
Present draft sections 1,2, 3	**0**	**October 20th**
Section 4: Outcomes	5	November 17th
Create room for Dreaming	8	October 25th
Create room for Playfulness	8	November 1st
Create room for Tolerance for risks	8	November 7th
Create room for Mindfulness	8	November 11th
Pilot session with distance students and faculty	2	November 14th

Section 5: Key Learning	5	November 14th
Section 6: Conclusion	5	November 16th
Present draft sessions 4,5,6	**0**	**November 17th**
Write Conclusions and abstract	5	November 30th
Section 7: Appendix and bibliography	2	November 30th
Presentation	**3**	**December 1st**
Final write up	**8**	**December 8th**
Signature	**3**	**December 15th**

Total 12 weeks / 110 hours

Section Four

What will be the Tangible Products or Outcomes? (Original)

The tangible outcomes will be four virtual rooms in the OpenQwaq platform.

Section Five

Personal Learning Goals:

- Learn how the affective elements of creativity can be taught through immersion in virtual worlds.

- Develop technological skills to connect people from all over the world.

- Deepen my knowledge about Affective Skills in the Creative Problem Solving Process.

- Make a personal transition from the CPS plain language model to the CPS Thinking Skills model.

What Criteria Will You Use To Measure The Effectiveness Of Your Achievement?

My success will be mainly measured by self evaluation guided by the following criteria:

- Do I meet the deadlines on time?

- Is the process challenging me?

- Is the project increasing my understanding of the Thinking Skills model?

Evaluation (Original)

The timeline presented above will serve as a success tracker and checklist of performance. The process will also be documented with snapshots of the construction process. In addition, once the rooms are built, a pilot session will be conducted with faculty, students of the Creative Studies program and friends residing abroad.

The final presentation will incorporate a tour inside of the rooms with explanations about the process and consideration for the use of these spaces.

Appendix B: FourSight Preferences

Clarifier

Clarifier-at-a-glance...

Enjoys exploring challenges and opportunities

Likes to examine the details

Wants a clear understanding of the issue

Prefers a methodical approach to solving problems

May suffer from "analysis paralysis"

Clarifiers are...

Focused   Methodical

Orderly   Deliberate

Serious   Organized

Give Clarifiers...

Order

The facts

An understanding of history

Access to information

Permission to ask questions

Clarifiers annoy others by...

Asking too many questions

Pointing out obstacles

Identifying areas that haven't been well thought out

Overloading people with information

Being too realistic

Ideator

Ideator-at-a-glance...

Likes to look at the big picture

Enjoys toying with ideas and possibilities

Likes to stretch his or her imagination

Enjoys thinking in more global and abstract terms

Takes an intuitive approach to innovation

May overlook details

Ideators are...

Playful   Imaginative

Social   Adaptable

Flexible   Adventurous

Independent

Give Ideators...

Room to be playful

Constant stimulation

Variety and change

The big picture

Ideators annoy others by...

Drawing attention to themselves

Being impatient when others don't get their ideas

Offering ideas that are too off-the-wall

Being too abstract

Not sticking to one idea

Developer

Developer-at-a-glance...

Enjoys putting together workable solutions

Likes to examine the pluses and minuses of an idea

Likes to compare competing solutions

Enjoys analyzing potential solutions

Enjoys planning the steps to implement an idea

May get stuck in developing the perfect solution

Developers are...

Reflective   Cautious

Pragmatic   Structured

Planful

Give Developers...

Time to consider the options

Time to evaluate

Time to develop ideas

Developers annoy others by...

Being too nit-picky

Finding flaws in others' ideas

Getting locked into one approach

Implementer

Implementer-at-a-glance...

Likes to see things happen

Enjoys giving structure to ideas so they become a reality

Enjoys seeing ideas come to fruition

Likes to focus on "workable" ideas and solutions

Takes the Nike approach to innovation (i.e., "Just Do It!")

May leap to action too quickly

Implementers are...

Persistent   Decisive

Determined   Assertive

Action-oriented

Give Implementers...

The sense that others are moving just as quickly

Control

Timely responses to their ideas

Implementers annoy others by...

Being too pushy

Readily expressing their frustration when others do not move as quickly

Overselling their ideas

Table 2. FourSight Preferences. Retrieved from: http://www.foursightonline.com/images/stories/pdf/sample_teamreport4-11.pf

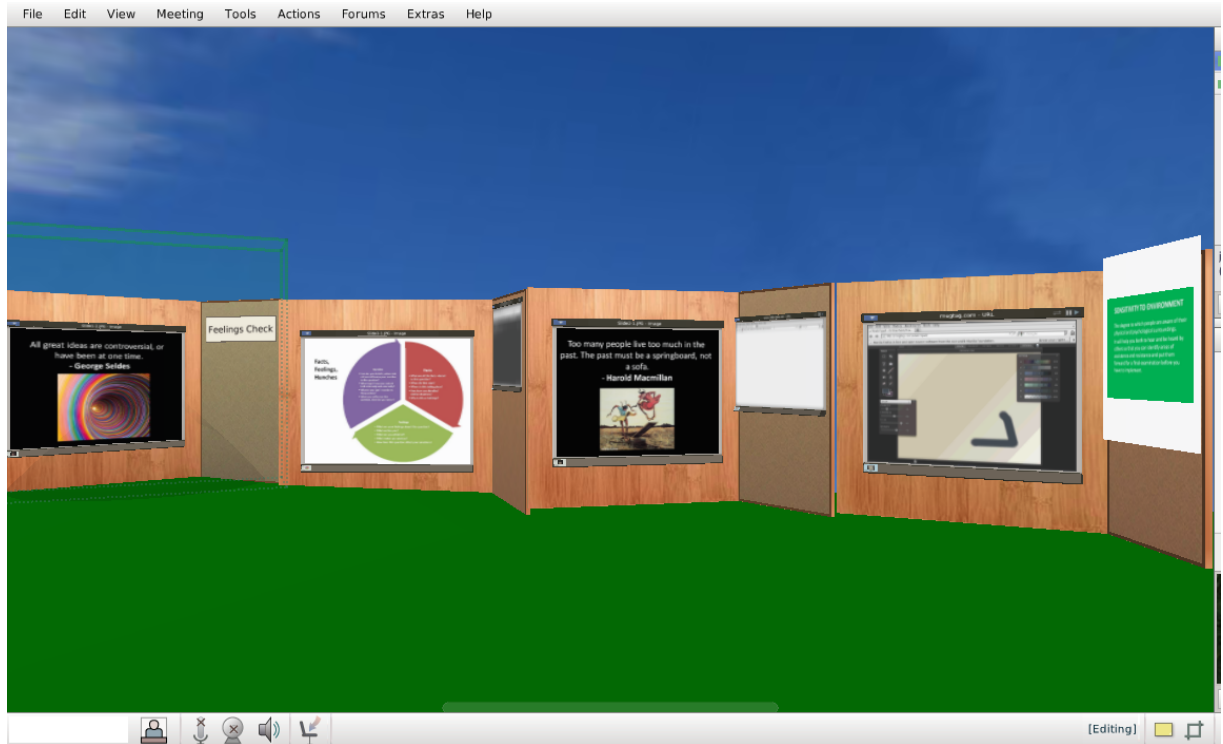**Appendix C: Screenshots of OpenQwaq Platform**

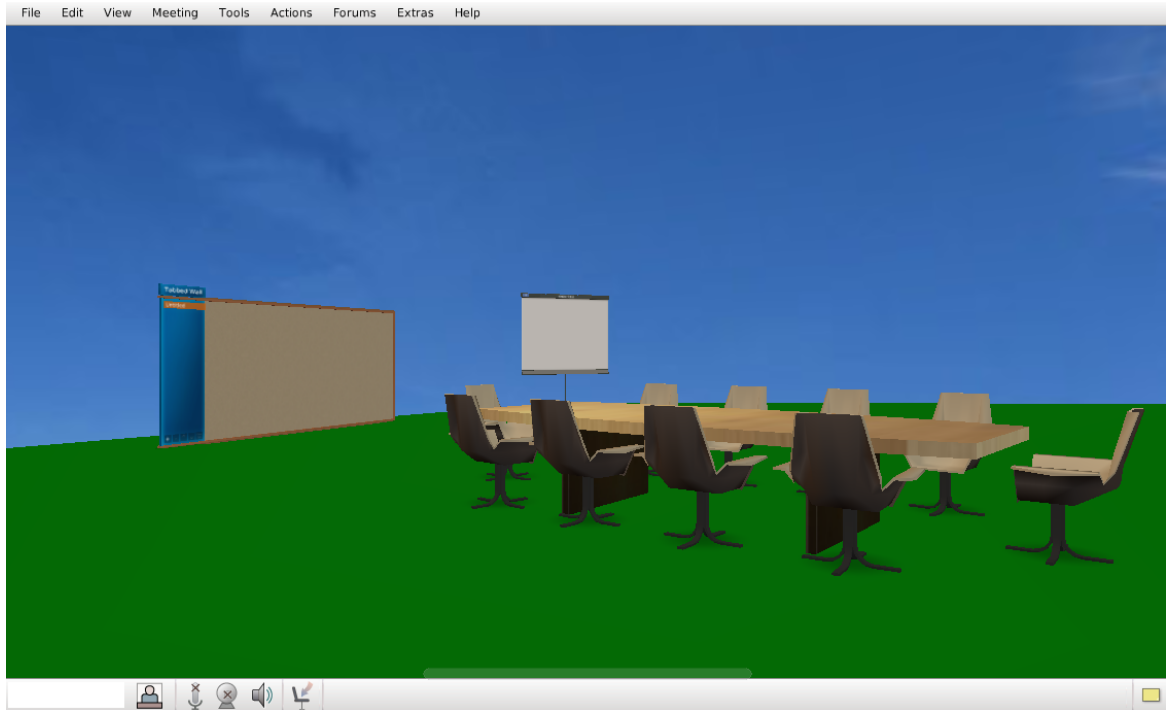
Figure 10. Inspiration corner for sensitivity to environment

Figure 11. Boards and displays as seen on the development platform

Figure 12. Recommendations to increase sensitivity to environment

Increase your tolerance for risk

- Do something new and different that makes you nervous.
- Make a list of things you are apprehensive about; pick one and decide how you would confront or attack it.
- "Feel the fear and do it anyway!"
- Reflecting on the past, recall a time when you didn't take a risk. What would have happened if you did? What stopped you? What could you have done differently?
- Make a Big Risk list! What steps could you take to make something on that list less of a risk?
- Don't wait for others to give you encouragement; learn to monitor your own "praise to criticism ratio".

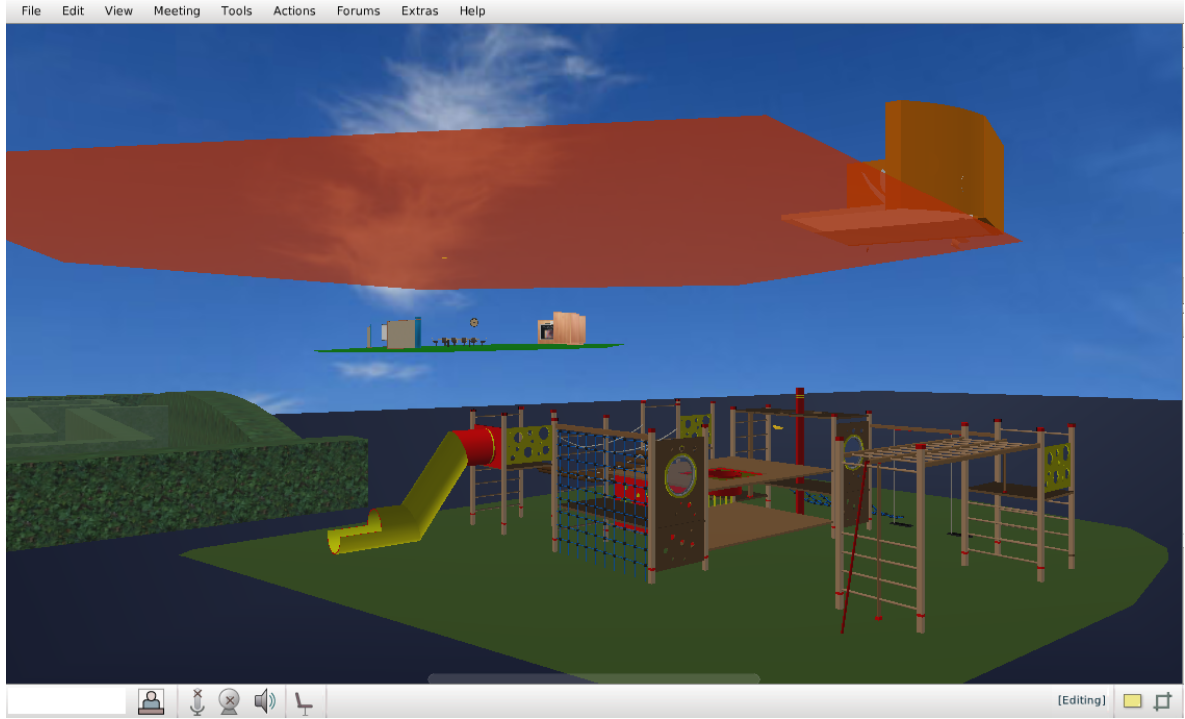**Figure 13.** Recommendations to increase the tolerance for risk

Figure 14. Island

Figure 15. Playground
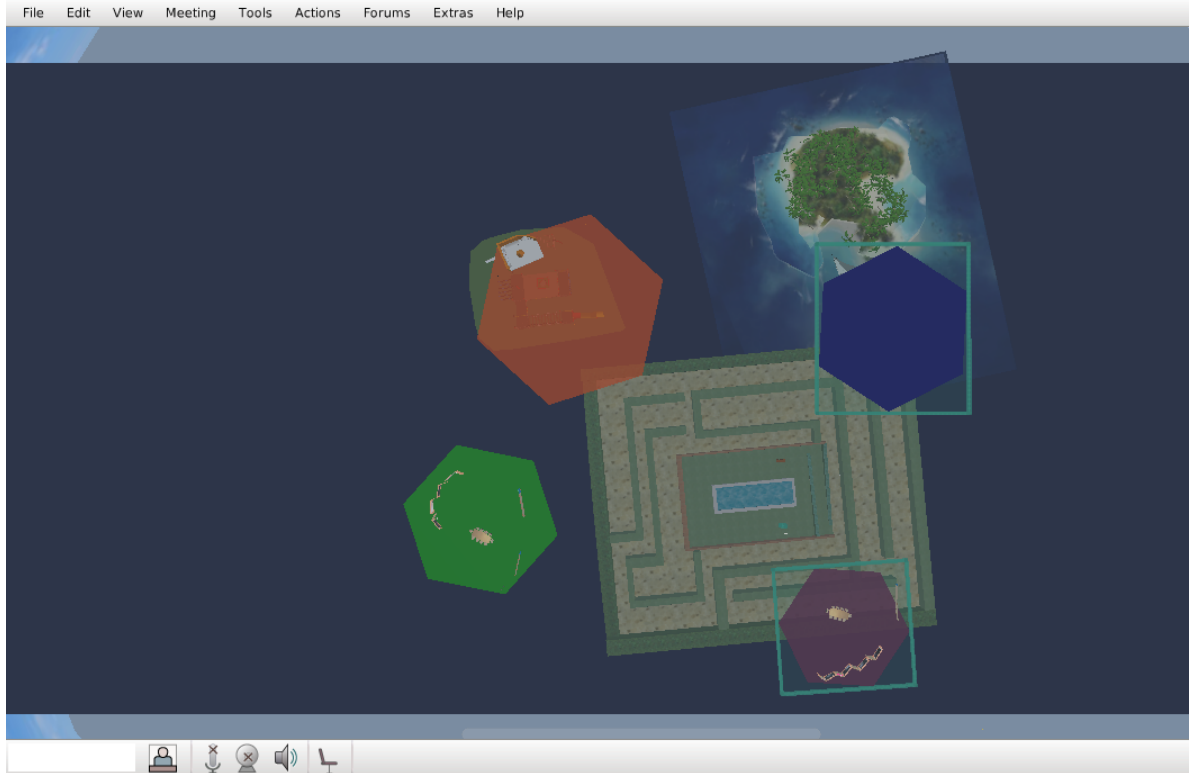
Figure 16. Platform seen from above.

Appendix D: Finger Labyrinth

Desktop Finger Labyrinth

Keep this labyrinth on your desk. When you are stressed and need to relax, use your finger to slowly trace the path into the center and then out to the entrance. The spiraling path of the labyrinth teaches us to slow down and refocus as we become more centered and balanced.

Source: Finger Labyrinth. Retrieve from:

http://www.lessons4living.com/Finger%20Labyrinth.PDF

Appendix E: Fact, Feelings, Hunches Tool

Fact are hard data; things you know and can validate (think cognitive, logic and rational). Feelings are emotions you experience when your needs are met (happy) or not met (sad, disappointed). Hunches are things you know you must do and cannot explain how you know or validate why you do.

Hunches
- How do your beliefs, values and cultures influence your reaction to this question?
- What 'signs' have you noticed both internally and externally?
- What is your 'gut' reaction to this question?
- When you reflect on this question, what do you notice?

Facts
- What are all the facts related to this question?
- When did this start?
- Where is this taking place?
- How have you handled similar situations?
- Why is this a challenge?

Feelings
- What are your feelings about this question?
- What excites you?
- What are you afraid of?
- What makes you anxious?
- How does this question affect your emotions?

Adapted from: Burnett, C.A. & Francisco, J. M. (2010). *Striking the balance between intuition and logic in your Creative Problem Solving Practice.* Unpublished learner guide. Buffalo, NY: International Center for Studies in Creativity.

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Juliana Sánchez Trujillo

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Date