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VIRTUAL REALITY IN ART EDUCATION

Sohhyoun Yoon
Virginia Commonwealth University

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School of the Arts
Virginia Commonwealth University

This is to certify that the thesis prepared by Sohhyoun Yoon entitled VIRTUAL REALITY IN ART EDUCATION has been approved by her committee as satisfactory completion of the thesis requirement for the degree of Master of Art Education

Dr. Melanie L. Buffington, Assistant Professor, Department of Art Education

Dr. Sara Wilson McKay, Assistant Professor, Department of Art Education

Dr. Pamela G. Taylor, Chair and Associate Professor, Department of Art Education

Dr. Richard E. Toscan, Dean of the School of the Arts

Dr. F. Douglas Boudinot, Dean of the Graduate School

May, 2010

VIRTUAL REALITY IN ART EDUCATION

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of
Art Education at Virginia Commonwealth University.

by

SOHHYOUN YOON
BFA, Hongik University, Seoul, Korea, February 1997

Director: DR. MELANIE L. BUFFINGTON
ASSISTANT PROFESSOR, ART EDUCATION

Virginia Commonwealth University
Richmond, Virginia
May, 2010

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VIRTUAL REALITY IN ART EDUCATION

By Sohhyoun Yoon, MAE

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of Art Education at Virginia Commonwealth University.

Virginia Commonwealth University, 2008

Major Director: Dr. Melanie L. Buffington
Assistant Professor, Art Education

This thesis project presents possible uses of Virtual Reality for art education. To understand VR, this thesis reviews the history of using technology in educational environments and explores the concepts, definitions, and characteristics of VR in general. Then, it shows diverse purposes of VR for education and art educational environments. For an art class, the units present the use of Teen Second Life, which is a free on-line virtual world. The units demonstrate how art educators may use Teen Second life for high school art classes to build students' understandings of their identities by creating their avatars, clothing, objects and artwork and by displaying the

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artwork in a virtual community. The purpose of this thesis project is to suggest possible

uses of VR for art educational environments.

CHAPTER 1

Introduction

As technology develops at a fast speed, educational environments for children and educators also change very quickly. Technology plays such a crucial role in contemporary society that many of us could not imagine what our life would be like without computers and the Internet. Computers serve as vehicles through which teachers and students can conduct their studies, design and create art, and obtain information. The widespread use of computers and progression of media led to the development of "Virtual Reality" (Sherman & Craig, 2003).

Background of Virtual Reality (VR)

"Virtual Reality" is a technology, which allows a user to interact with a computer-simulated environment, be it a real or imagined one. The term "Virtual Reality" (VR) was coined by Jaron Lanier, who is computer scientist and philosopher, in 1989 in conjunction with his Virtual Programming Language (VPL) Research (Albani & Lee, 2007; Grau, 2003; Sherman & Craig, 2003). Also, VR allows users to experience sensory input in a three-dimensional space (Sakatani, 2005). Burdea and Coiffet (2003) stated, "Virtual reality is a high-end user-computer interface that involves real time simulation and interactions through multiple sensorial channels. These sensorial modalities are visual, auditory, tactile, smell, and taste" (p.3).

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VR represents a new stage in computer technology that allows more interaction using software and responds to the users' actions (Sherman & Craig, 2003). According to Jackson, Taylor and Winn (1998), this new technology has significant potential in the education field. Byrne (1993) pointed out that VR helps students understand complex data in science. At this point, it is valuable to look over the efforts of applying VR for educational purposes in general, and to seek possible uses in art education. VR spaces have been used in various areas such as art, science, medical science, and general education (Kommers & Zhiming, 1997). This shows that it is worthy to explore the use of VR in art education as well.

In this research, I will examine two major questions related to using VR to help students learn art: (1) What types of Virtual Realities exist and are currently used in education? (2) What would a VR art curriculum for high school students to use Second Life entail?

Literature Review

"Virtual Reality" is a powerful human-computer interface that has implications for many areas (Burdea & Coiffet, 2003). Kommers and Zhiming (1997) wrote, "VR is a newly emerging tool for scientific visualization that makes possible multisensory, three-dimensional modeling of scientific data" (p.4). They also pointed out that even though VR technology was still primitive, the use of VR could be predicted to broaden in telerobotic, telepresence surgery, virtual chemistry, virtual planetary travel, virtual

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entertainment, and architectural design. Youngblut (1998) described over fifty Virtual Reality applications in desktop and Head-mounted display (HMD) environments for diverse educational purposes, showing that the use of VR can be extremely widespread. Also, he presented how VR helped students learn new concepts through VR technology. Due to the positive prospect of using VR in education, two studies were conducted by the Human Interface Technology Laboratory (HIT Lab) at the University of Washington in collaboration with the Pacific Science Center (1992). The purpose of these studies was to find whether students age 10 to 15 could work with VR technology and enjoy VR. These studies found that many of the children involved were able to learn VR through the process of creating virtual spaces (Byrne, 1993).

According to Youngblut (1998), the HIT Lab collaborated with an educational development center to develop a VR system in a van. Named the Virtual Reality Roving Vehicle (VRRV), this van brings VR to schools and gives students and teachers the opportunity to experience and create VR. The use of VRRV let students be more involved in the development of VR on the topics of Wetland Ecology and Global Warming. Also, this project gave teachers a chance to learn and create VR including "Atom world" which helped students learn science concepts. The objective of developing the VRRV was to teach children to make virtual worlds so that they can better understand the curriculum and to achieve specific learning goals (Mellet d'Hauart, Richard, & Follut, 2001).

Harmony Quest, a VR for an interdisciplinary art curriculum, was designed to expose students to VR technology. The goal of this art-based study was to raise

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students' awareness of important roles in collaboration and to develop multidisciplinary curricula for the benefit of many people. Another goal was to make VR accessible in schools and communities (Sakatani, 2005). According to Sakatani (2005), in Harmony Quest, students extended their confidence in their own learning as they experienced VR within supportive groups. Through this teaching and learning process, students were exposed to diverse information, resources, Internet, e-mail and experienced VR with joy.

Methodology

Background to the study

This thesis project is part of an initial attempt to explore the possible uses of VR in art education. I first introduce the concept of VR and explain how VR has affected educational environments. I then examine the present use of technology relevant to VR in art education through a literature review. Following the literature review, I present units of instruction for high school students to use Second Life which is a 3-D virtual world entirely built and owned by its residents. The units involve the VR Second Life and an interdisciplinary art curriculum for secondary art students.

Design of the study

In the literature review, I examine the use of VR technology in education and art education. Also, I review the development of VR from the beginning to the present. By examining the brief history of the VR, I found diverse purposes for using VR in education, special education, art, games, and entertainment. Therefore, I used these ideas when designing the units for a high school art class using Teen Second Life. The

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use of Teen Second Life may facilitate dynamic communication online between students or students and teachers through VR. Also, this VR may be used to lead an interdisciplinary art unit for students in various school subjects. The purpose of the units is that students learn and experience art through Second Life, extend their ideas in art making, and become aware of their responsibilities in an online community.

This thesis project will help art educators learn effective ways to bring VR to the art classroom. Moreover, this project will open people's eyes to the advantages and disadvantages of using VR for art education. The important point is how we, art educators, can use VR and transform it into an effective vehicle to improve students' learning.

Significance of the study

Technology is still not being widely used in the classroom (Gura & Percy, 2005). Also, the use of technology for art classrooms needs to be part of a well-organized system so that an individual teacher is not on her or his own to develop an entire program (Delacruz, 2005). Delacruz (2005) suggested that although using technology in the art class depends on school systems and art educators, generally many art educators know the importance of using the Internet to access abundant information.

Using VR for art education purposes has not been explored sufficiently. That is to say, little is written on VR in art education compared to other educational applications of VR. Even though VR is an advanced technology, it is possible to access

the online VR community Second Life and use it for free. Therefore, this project may help art educators become aware of VR technology and apply VR to art classes.

The ideas embedded in this curriculum may be useful to teachers and will help them develop their own VR units. The curriculum I developed to use VR gives an opportunity to facilitate students' diverse identity and provides teachers and students with new ideas about using VR in art education. Also, art teachers and parents can use VR as a tool to help students better understand art and develop creative ideas. Moreover, the use of VR for art educational purposes extends the realm of VR and may allow more people to see the important role of art in our lives.

Suggestions for further research

VR is a technology that is used to create virtual spaces. It shows a great potential in aiding learning and teaching, therapy, creating art works and also impacting lives (Burdea & Coiffet, 2003). It is time to think about and develop VR for art educational purposes so that more children will benefit from this new technology.

Conducting a survey is one way to understand art educators' diverse opinions and knowledge about VR. Before VR can be effectively implemented on a wide scale, it is important to know what teachers know about it. A survey of art educators in Universities, k-12 schools, and museums may lead to different results. These different outcomes may help art educators use the new technology for better art educational environments.

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Also, there is a possibility for teachers to work with universities to make better art educational environments. Art educators could think about finding connections with VR classes in a college or university. For example, VCU's Kinetic Imaging department offers a Virtual Reality class. In that class, art and computer science major students make diverse interactive artworks in collaboration. If art educators design collaboration between a university and community or school for k-12 students, there may be more chances for students to experience VR.

Furthermore, case study is a possible methodology for future studies. Art educators could use VR programs, such as Blender, to create VR with interactivity on desktop computers. Or they may present VR in any classroom with a projector, making it possible for students to experience a new world via computers or the Internet. A case study of a teacher, who develops VR for middle or high school students, could investigate the effects on students learning of art concepts. Although now it might not be easy to have immersion VR available for all children, in the future VR may be widely accessible.

Another idea for future research is to develop a curriculum using VR for children with learning disabilities or autism. This would allow children to experience art and to improve their learning and social skills. My research about VR and units using VR will provide good examples for future studies in the art education field. Even though VR is a new technology and its future in art education is unknown, there are many possibilities to develop and use VR for art educational purposes if people have a better understanding of it.

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CHAPTER 2

Introduction

In the previous chapter, I discussed the potential uses of VR technology and the direction of this research project for educational environments. The goal of this chapter is to introduce the brief history of technology in education, VR technology and its applications in education, and the possible uses of Second Life in education and art education. Moreno (2005) believed that education is generally improved by the development of technology and that the use of technology promotes a higher efficiency of learning in education. VR, an environment created and accessed by the computer, has the potential to be used for educational purposes (Youngblut, 1998). Also, VR allows people to interact with or be immersed in a simulated three-dimensional world. The interaction in VR is one way to promote student learning (Sakatani, 2005). In the following pages, I review literature on the three main areas of: technology in education, VR, and Second Life as related to this thesis project and explore the classroom uses of each.

Second Life is a three-dimensional free virtual online community, which allows users to build virtual spaces and to strengthen the communication between residents in the Second Life environment. Harvard and San Diego University use this online community for educational purposes including a virtual lecture rooms (Hobbs, Golden,

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& Brown, 2006). This on-line virtual space also gives students an opportunity to broaden their learning.

Technology in Education

Introduction

In contemporary society, some educators use technology for their classrooms. According to Gura and Percy (2005), digital technology assists in the teaching and learning process. For this reason, educators who have a positive attitude towards technology may try to use technology to create a better educational environment for their classes. Although the contemporary attitude toward technology is tightly bonded to the use of computers, technology in the past, aside from computers, was used to facilitate education (Moreno, 2005). At this point, it is important to take a look at the development of technology in educational environments and how educators used technology in their effort to improve teaching and learning in the past.

History of Technology in Education

Teachers have considered the use of various technologies to improve teaching and learning for many years. Different types of technology, such as motion pictures, radio, TV, and computers have been used in education for at least 80 years (Cuban, 1986). According to Cuban (1986), Thomas Edison predicted the use of motion picture and radio for the purpose of education in 1920s. Also, starting in the mid-1950s, educators began using TV as a teaching aid. Since computers arrived in schools in the 1980s, some schools have used computers as a medium to help students' learning.

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Motion picture

In 1922 Thomas Edison said "the motion picture is destined to revolutionize our educational system and that in a few years it will supplant largely, if not entirely, the use of textbooks" (Cuban, 1986, p.9). According to Paul Saettler, in Rochester, New York public schools used films first in 1910 and in 1917 the Chicago schools made a "visual department." Twenty-five states used films and visual elements in education department by 1931 (As cited in Cuban, 1986). Cuban (1986) stated, "classroom use of films became a symbol of progressive teaching approaches" (p. 12). However, films were used infrequently in educational environments for a few reasons: lack of facilities and appropriate films, high cost, consistent inaccessibility of facilities (Cuban, 1986).

Radio

Radio was first used as a teaching tool in the 1930s. The founder and first director of the Ohio School of the Air, Benjamin Darrow claimed that radio would bring changes to classroom and help teachers with their teaching. Also, the CBS American school of the Air made an effort using radio as running weekly programs for classroom. However, radio could not settle in classroom because of many reasons including poor equipment, scheduling difficulties, poor reception, and lack of information (Cuban, 1986).

Television

 Television launched the classroom in the 1950s. Cuban (1986) described an

attempt that schools used television as "total instructional program presented by

television teacher," "supplemented television instruction," and "television as a

teaching aid" (p.29). However, television in education from the 1950s to the 1980s

was not used as a primary vehicle. Only a small group of teachers used television

continuously and enthusiastically. Also, teachers used television more in elementary

schools used than in secondary schools and they preferred to use it in the afternoon

(Cuban, 1986).

Computers

Computers were the newest technology to enter education and were heralded

with creating the "information revolution" in the 1980s. However, educators used the

computer infrequently (Cuban, 1986). John and Wheeler (2008) presented a study of

barriers of using Information and Communication Technology (ICT) in the classroom,

some of the factors include: "lack of time, effective training, access to resources,

technical problems, and negative attitudes with no perception of benefits" (p.21). Even

though this pattern of technologies entering education has been repeated with mixed

results, efforts to use technology continue with the hope of finding ways to improve

teaching and learning (Clark, 1999; Cuban, 1986; Moreno, 2005). Possible uses of the

computer in education are: Productive Tools (word processors, spreadsheets,

presentation software), Development Tools (image editing software, digital drawing

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tools, webpage development packages), Communication Tools (discussion board, e-mail, websites, building virtual campus) (Recesso & Orrill, 2008).

Internet

In the early 1990s, educational institutions and libraries started to connect to the Internet (Jones, 1999). The development of the Internet may make human life more dynamic than before as people communicate and interact through this technology (Phipps & Merisotis, 1999). Becker (1999) demonstrated that over 90% of public and private schools could access the Internet. Buckingham (2006) presented that the development of the Internet leads to a new style of communication, playful learning to build new communities, and the development of critical thinking. As a result, the Internet enables communication between students or students and teachers through e-mail and online chat rooms for educational purposes (Enriquez, 2007). Now, it is hard to imagine any educational system in a developed country without the Internet.

Summary

Cuban (1986) documented that schools used new technologies for educational purposes when they became available. However, these uses of technology to further teaching and learning were not as effective as was hoped because of financial difficulties, insufficient education of teachers, and the shortage of required equipment. This pattern of the non-use of technology still exists in education (Cuban, 1986). Also, technological developments in educational environments bring new ideas, portable

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information, and online multidimensional communication to classrooms (Gura & Percy, 2005).

Virtual Reality

Introduction

VR is a newer technology that may affect education and art education. Burdea and Coiffet (2003) stated, "VR is simulation in which computer graphics is used to create a realistic-looking world" (p.3). To understand how VR could be used for art educational purposes, it is important to examine how VR was developed, what characteristics VR has, and the diverse purposes of VR. Then, it may possible to apply VR to create an enjoyable art educational environment.

Term and definition

VR includes visual and interactive computer-generated spaces that users can navigate and explore (Dodge & Kitchin, 2001). Sherman and Craig (2003) defined VR as "A medium composed of interactive computer simulations that sense the participant's positions and actions and replace or augment the feedback to one or more senses, giving the feeling of being mentally immersed or present in the simulation" (p. 13). Virtual reality has been called "Artificial Reality" (Krueger, 1970) and "Cyberspace" (Gibson, 1984). Lanier used the term "Virtual Reality" (VR) in 1989 in his Programming Language (VPL) research (Steuer, 1992). Krueger (1991) presented

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the term "Virtual reality" and mentioned three-dimensional environments using goggles and gloves.

Characteristics of VR

For a better understanding of VR, it is important to consider what makes VR unique, how VR differs from physical reality, what people experience through VR, and how this new experience is applicable for learning. Kommers and Zhiming (1997) identified and analyzed four different levels of VR— immersion (Windowing versus head-mounted displays), interaction (Navigation versus manipulation), entities (Information- via object into concept orientation), and concrete versus abstractness (within the concept-orientation approach the VR environment may vary between perceptual versus mental representations). With these four levels, people can totally immerse in the VR as well as collaborate and interact with the objects or people (Salis & Pantelidis, 1997). According to Ausburn (2004), interactivity is one of the important characteristics in VR technology that allows individuals to communicate with others or the digital objects in the VR environment. Also, as Osberg (1993) pointed out, VR environments with immersion and inclusion may give students opportunities to create new symbol systems as they interpret the environments with their own perception from the experience in VR.

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Possible uses of VR

   For artworks

Some artists use VR technology to create art works that involve the viewers in interaction. Utterback and Achituv (1999) created *Text Rain*, an interactive installation in which participants use the familiar instrument of their bodies to lift and play with falling letters on the screen. Other large immersive VR projects include *Osmose* and *Ephemere*. David (2003) described *Osmose* (1995) as a full-body immersion VR using a stereoscopic Head-mounted display (HMD). In this VR, people can navigate and interact with three-dimensional imagery based on users' breathing and balance. Users can float and fall in the VR environment. In *Osmose* (1995) people can experience nature including forests, tree leaves, ponds, clouds, and the earth through virtually walking and flying

   For entertainment and education

Characteristics of VR technology such as immersion and interaction make VR technology appropriate for games and entertainment (Burdea & Coiffet, 2003). Also, according to Rooney and Namee (2006), VR games have the potential to promote learning. Collaborative virtual environments in online games help students experience and understand stories and context with joy (Holland & Flagg, 2004). Facilitating contemporary students' short attention span, VR can entertain in form, yet teach in function.

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Summary

The unique characteristics of VR include immersion and interactivity. These characteristics make VR special and also can be an advantage for diverse purposes including artwork, entertainment, and education. For example, an educational game helps students solve problems, think critically, and collaborate with others (Van Eck, 2006). It is possible to use VR to help students learn content and social skills.

Virtual Reality in Education

Introduction

Numerous projects have shown that VR has significant potential for educational purposes in many areas (Youngblut, 1998). According to Youngblut (1998), VR technology can promote learning as students experience abstract concepts, atomic scales, virtual environments, and interact with objects or events in new spaces. Learning through VR can involve exploring existing VR environments, constructing simulation models, and improving social interaction skills (Burdea & Coiffet, 2003). New experiences in VR can be available to students without the hindering factors of safety or student ability level (Cromby, Standen, & Brown, 1995). Because of these attributes, VR in education may help facilitate learning and teaching concepts in contemporary classrooms.

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On the other hand, it is true that there are some concerns about the negative effects of VR, such as the doubt and confusion about the behavior and role between real and virtual worlds (Osberg, 1993). Also, people who want to apply VR systems for education need a vast amount of money.

Benefits of VR for Education

One benefit of VR is learning from active experiences in a creative space as opposed to traditional educational methods, such as instructional lectures (Sherman & Craig, 2003). According to Sherman and Craig (2003), the Narrative Immersive Constructionist/Collaborative Environments project (NICE) is a VR application for education with the goal of encouraging the use of educational theories such as constructivism and collaborative learning. Interacting through networked computers in NICE helps students collaborate with other groups. Also, NICE includes the recording of the histories of interaction that makes possible to create narrative stories as participants interact with others.

Another benefit of VR is that children can easily understand the concepts and graphics of VR in 3-D spaces (Provenzo, 1991) as they interact with abstract ideas and visual elements (Spalter, Stone, Meier, Miller & Simpson, 2002). Holland and Flagg (2004) stated, "A virtual environment where anyone can take on a role, experience a story and contribute to a solution may be especially attractive to teenagers" (p. 31). The chance to experience diverse VR may enhance the participants' abilities such as problem solving and creativity (Osberg, 1993).

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Also, VR technology involving collaboration could improve social skills through interaction with people in a VR environment. River City is a collaborative real time interactive virtual learning environment in an online museum. River City, which is based on fictional content, helps students understand the context with fun and build relationships not only between schools and museum but also, museums and students (Holland & Flagg, 2004).

Concerns of VR for Education

It is true that VR has positive features in educational environments yet at the same time, there are concerns about VR technology. Roussou (2000) presented several critical issues of VR technologies in education. One of the issues is that technology must be used in an educational context. She stated, "Technology cannot stand alone" (¶. 16). This statement relates to the issues surrounding the physical place where VR is presented and the group which is targeted. She believes that VR should be a natural immersion with physical elements that are comfortable and contain high quality graphic representations. The design of VR should include a structure where immediate feedback is available within an extended session. Also, there should be a low learning curve related to understanding how to use the VR environment to remedy students' frustration related to a poor interaction design. Also, it is important to strike a balance between content and technology. The most obvious concern is the high cost associated with the medium. The same physical hardware used for interaction may not be well suited for all

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children because of their different body sizes (Roussou, 2000). Most of these issues can be solved in the design process in the VR production for education.

Educational application

The possible educational areas of VR include science, medicine, math, language, history, art, etc. (Youngblut, 1998). For a better understanding about VR in education, it is important to investigate what kinds of educational VR application exists.

Medicine is one of the possible uses of VR for education. According to Human Interface Technology laboratory (n.d.), Mark Billinghurst has developed a surgical assistant using VR. The purpose of this VR is to help surgeons practice a simulated dangerous surgery with voice and visual feedback from the system. During the virtual surgery, the user can interact with the system to get important medical information and also get warnings about risky procedures.

There are some VR applications for science education (Youngblut, 1998). One application is "Cell biology" which uses stereoscopic HMDs. Through this immersive and interactive VR application, children can learn about and build different types of cells.

Spatial abilities are one area that can be enhanced through VR (Kaufmann, 2003). Kaufmann and Schmalstieg (2002) presented the use of VR for geometry education in the effort of systematic improvement. They introduced Augmented Reality (AR), which is a type of VR. AR allows a user to observe virtual elements in a virtual space adding a physical action in a real world on top of virtual contents in the same

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space. For example, physicians might use AR to see the internal organs and external view of patients at the same time (Sherman & Craig, 2003). The difference between VR and AR is that AR involves physical action in VR unlike traditional concepts of VR. Through this process, students can actually observe 3D objects and learn complex spatial concepts and relationships.

The Foundation of the Hellenic World (FHW), a non-profit cultural inheritance institution, has a goal to conserve and spread Hellenic culture, history, customs, and architecture through VR. This VR allows users to immerse in the VR world and interact with the elements in VR so that users can identify their behaviors and choose personal paths in the VR. This VR promotes the understanding and exploration of the Hellenic culture in new ways (Gaitatzes, Christopoulos, Voulgari, & Roussou, 2000). According to them, this VR used contemporary museum theory, computer science, and audiovisual media with interactivity.

It is also possible to use VR to meet goals for students with disabilities. Kommers and Zhiming (1997) noticed that Woodward (1992) studied the possible uses of VR for students with disabilities. This VR helped emotionally disturbed students to learn in non-traditional ways such as practical activities to investigate nature. Also, the process of using VR guided the students to develop adequate relationships with peers and teachers (Hausman, 1994). Kim (2004), a graduate student in graphic design at Minneapolis College of Art and Design, designed VR for children with autism. Kim explored previous efforts people made for autistic children, such as The AuRoRa and

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Logo projects, both of which used interaction with technology. The purpose of these projects is to teach children social interaction and communication. Also, Youngblut (1998) presented VR application for students with disabilities and autism. "The Life Skill World," which is a virtual supermarket helps students with learning disabilities to promote their life skills as experiencing shopping in the VR.

Summary

In summary, many VR applications have been developed for educational purposes and educators may consider the use of VR technology to improve education. Also, using VR may be one way to provide a new educational environment and this new environment may allow teachers and students to deeply engage with diverse academic areas. Even though few art educational applications of VR currently exist, there are possible ways to develop and use VR for art educational purposes. As mentioned before, the use of VR has advantages and disadvantages in educational environments. It is important for art educators to make appropriate and useful curricula with this newer technology.

Second Life in Education

Introduction

The development of technology brought the social virtual world, which allows people to communicate through the Internet. This online social space includes a graphical representation of users such as personal avatars and coincident interaction

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through chatting. Also, this social virtual world has the potential for community development and educational purposes (Hayes, 2006). One good example of a social virtual world is Second Life (SL), which is a three-dimensional on-line community created by users. Linden Lab created Second Life in 2003 and the company started educational programs for university courses (Conklin, 2007). Second Life allows users to register for free and to create their avatars, which are graphical images of people in Second Life. Avatars represent virtual identities of the users and, with their identities, they can navigate virtual places, meet and communicate with other residents in Second Life (Hayes, 2006).

Second Life and education

Creation tool

Through Second Life people can create virtual lives including avatars, houses, and social relationship (Hayes, 2006). In Second Life tools are required to create avatars with clothing, skin, and other forms (Hayes, 2006). Also, through Second Life, users experience the economic, social, and cultural contexts of this virtual world (Hayes, 2006). In Second Life some residents have jobs such as texture designers, clothing designers, builders, and landscapers. These residents use tools in Second Life or other graphic software to make high quality creations. Also, some educators in Second Life created the international spaceflight museum, made a model of the solar system, and built architectural forms from ancient Egypt. These creations make it possible to build

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something that is perhaps impossible to experience in real life (Rymaszewski, Au, Wallace, Winters, Ondrejka, Batstone-Cunningham, & Second Life residents, 2007).

Virtual Lecture room

In Second Life, Dr. John Bransford, an educational psychology researcher, had a lecture room to present the topic about "communication and teamwork in a collaborative learning setting" (SimTeach 12, 2006, p. 3). He discussed the educational potential of VR and over 80 avatars participated in the lecture (SimTeach 12, 2006). Also, Dr. Gary Marchionini presented "Toward multimedia Surrogation" in Second Life (Second Life Binary Footprint, 2007). In addition, one good example is that Harvard's Berkman Center owns private island Berkman in Second Life for the purpose of holding in-world conventions. Harvard law school professors Charles and Rebecca Nelson use the Berkman island as a new educational environment (Rymaszewski, Au, Wallace, Winters, Ondrejka, Batstone-Cunningham, & Second Life residents, 2007).

Benefits of uses

According to Yellowlees and Cook (2006), the easy accessibility of Second Life for anyone who has a computer and Internet connection is a good advantage that many people can experience educational 3D visual surroundings. Wong (2006) presented several positive attitudes related to using Second Life for educational purposes. Wong interviewed people who teach through Second Life. One educator said, "The three-dimensional virtual world makes it possible for students taking a distance course to develop a real sense of community"(¶. 5). Also, another person who owns a company

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for developing distance courses for educational environments said that Second Life has a huge potential for the educational field. He emphasized a benefit of Second Life is that it allows students to have real-time interaction so that they can engage in discussion with others. Moreover, another educator incorporated VR for her digital communication class to provide a new way of collaboration after learning about Second Life from her son (Wong, 2006).

Concerns of uses

Groveman (2007) questioned about the positive outcome of communication and collaboration with peers in Second Life because students might be more likely to experience intimate and comprehensive interaction in real world. More importantly, Bugeja (2007) pointed out concerns about experiencing violence, assault, and sexual harassment in Second Life for use of classes in higher education. According to Linden Lab, creator of Second Life, two most frequent violations are assault and harassment in Second Life. Educators should warn students of the unexpected consequences of using Second Life for class and should give an option not to attend (Bugeja, 2007). According to the Indiana Law Journal, Eras Reuveni presented that people feel anger and grief in their real life after experiencing virtual sexual harassment (Bugeja, 2007).

Art education

The use of Second Life is growing in education (Conklin, 2006; Wong, 2006). Second Life has potential for art education because of its highly visual presentation. Alvarez (2006) found that one person learned 3D modeling and designing by using

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Second Life. She presented the possible uses of Second Life for 3D design classes and traditional fine art classes for students to create virtual galleries for a critique. Additionally, Alvarez (2006) presented that the use of Second Life promotes communication among students to share their interests.

Summary

In my opinion, one of the goals in education should be to provide students a better educational system, to experience this, and then to help them contribute to society. As presented, Second Life may be used to help students learn about their identity and to collaborate with others through experiencing a virtual 3D society. Second Life might help connect subjects such as sociology, graphic design, and visual art and display (Alvarez, 2006).

Conclusion

VR is a technology that may help create a better educational environment. Therefore, in this chapter, I investigated the brief history of using technology in general education. For better understanding of VR, I examined the definition, history, educational applications, and characteristics of VR. In this process I found some advantages and disadvantages of VR. As art educators it is important not only to understand the advantages of using VR to help students learn but also to be cautious of the disadvantages of using VR. Second Life is a new virtual online community available to anyone with Internet access. A version for teenagers exists and is called Teen Second

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Life. Second Life has great potential for educational purposes (Conklin, 2006; Hayes, 2006; Wong, 2006). Depending on how educators use the new technology, we can design new environments for students' learning.

The following chapter presents units of study involving Second Life for high school classrooms. In these units, I suggest ways for art educators to use this VR online community for their classrooms. Also, many educators may consider the use of new technologies to improve educational environments for their students and Second Life may be one way to accomplish this goal.

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CHAPTER 3

Introduction

VR is a three-dimensional technology that allows students to playfully explore art- creation spaces. As students experience new environments in VR, students may interact with others and with graphic elements. The purpose of this chapter is to present units about identity and art creation using Teen Second Life, an on-line VR environment for teens. In Part I, students create their identities by creating their avatars and clothing in Teen Second Life. Next, in Part II, students will develop an extension of their identities in Teen Second Life by creating digital artwork and by displaying it in a virtual space. As students create and role-play their virtual identities, they may understand their real identities in relation to social environments.

As members of diverse societies, it is important for students to understand and recognize their own identities. Adolescences start to encounter questions of who they are, what they want to become, and where they fit in society. Namely, they meet a point to make decisions whether they develop toward negative identity such as anti-social or toward positive identity (Erikson, 1968). Teenagers encounter a transition point in various role expectations that they can shape and develop their identities (As cited in

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Peterson, 1987). Peterson (1987) stated, "the self is not static entity, but a constantly changes process that arises and is shaped by social interaction" (p.239). Positive identity can be developed in adequate levels of "complexity", conflict", and "ambiguity" of roles in social relationships (Peterson, 1987).

Turkle (1984) presented that adolescents consider computer experiences to build and construct their identities. The Internet allows people to create and build multiple identities (Turkle, 1995). In the past, computer game Multi-User Domains (MUDs), text-based social virtual reality, allows users build their characters by constructing diverse roles and spaces by creating their own objects. Through this experience, users not only create different characters that they want to explore but also, construct their own identity based on real life characteristics (Turkle, 1995). Now, Teen Second Life, visual-based 3D virtual reality might help students build and explore different identities and find themselves as they interact and communicate with avatars and visual elements. As students learn about identity through VR technology, they may have a chance to think about their identity and understand diverse perspectives on gender, race, culture, and other people.

Part I: Unit Overview

In this unit, students will use the three-dimensional on-line virtual world Teen Second Life for an art technology class. This unit is for a high school advanced art technology class in which the students already know how to use graphic software

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including Adobe Photoshop. First, students will learn about two artists who have worked with the subject "Identity." Next, they will join Teen Second Life and will make avatars with clothing. Through making their avatars, students will think about their personal or imagined identities. Also, students will write journals through a class blog and post their pictures of avatars and clothing. As students use the blog, they will reflect on the process of the project and communicate with peers and teachers for critique.

The goals of this unit are to give students the opportunity to build their identities in Teen Second Life, to recognize the importance of their identities in society, and to build their artistic ability through designing clothing using the creation tool in Second Life and image editing program Adobe Photoshop.

Now, many students use computers for communication between friends and getting information. Also, they play games using computers and the Internet. The "big idea" of this unit is to build students' identities in Teen Second Life and also to help them become aware of their own identities in societies that they belong to as they experience the virtual world Teen Second Life.

Part I: Big Idea – Identity

Key Concepts

- Identity involves your
    - Philosophy
    - Cultural background

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- o Gender

- o Attitude

- o Habits

- o Appearance

- o Religion

- o Body type

- Identities change based on

  - o Different environment

  - o Different community

  - o Different time

  - o Different age

  - o Different situation

- Identity is a way of presenting oneself depending on behavior, acting and attitude in different genders, cultures, races, time and societies.

Terms

Ego, the self, social identity, cultural identity, gender identity, avatar

Essential questions

- What is identity?

- What makes your identity different than others? (Gender, race, culture, appearance, environment, characteristic, habit, age, attitude, acting, time)

- What are a few of the most important aspects of your identity?

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- How could you change your identity?

- How does your identity change in different environments such as home and school, or with different people such as friends, teachers, parents, siblings, and relatives?

- How do you act in situations with different people and environments?

Part I: Unit Objectives

Students have two options for creating their identities in Teen Second Life. They can reflect their real identities or can create the identities that they want to be in Second Life.

- Students will build their identities in Teen Second Life and recognize the importance of their identities in virtual and real societies.

- Students will describe their own identities as they learn about art works by Cindy Sherman and Kehinde Wiley.

- Students will create their virtual identities with their new names and role-play with their avatars in Teen Second Life.

- Students will design clothing for their avatars using the tools in Teen Second Life and the image editing program Adobe Photoshop.

- Students will use their avatars to communicate with peers and a teacher in Teen Second Life.

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Part I: Standards of Learning

National Standards for Art Education

Content Standard # 1: Understanding and applying media, techniques, and processes

- Students apply media, techniques, and processes with sufficient skill, confidence, and sensitivity that their intentions are carried out in their artworks

- Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques, and processes they use

- Students communicate ideas regularly at a high level of effectiveness in at least one visual arts medium

Content Standard # 2: Using knowledge of structures and functions

- Students demonstrate the ability to compare two or more perspectives about the use of organizational principles and functions in artwork and to defend personal evaluations of these perspectives

- Students create multiple solutions to specific visual arts problems that demonstrate competence in producing effective relationships between structural choices and artistic functions

Content Standard # 3: Choosing and evaluating a range of subject matter, symbols, and ideas

- Students reflect on how artworks differ visually, spatially, temporally, and functionally, and describe how these are related to history and culture

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- Students apply subjects, symbols, and ideas in their artworks and use the skills gained to solve problems in daily life

- Students describe the origins of specific images and ideas and explain why they are of value in their artwork and in the work of others

- Students evaluate and defend the validity of sources for content and the manner in which subject matter, symbols, and images are used in the students' works and in significant works by others

Content Standard # 5: Reflecting upon and assessing the characteristics and merits of their work and the work of others.

- Students identify intentions of those creating artworks, explore the implications of various purposes, and justify their analyses of purposes in particular works

- Students reflect analytically on various interpretations as a means for understanding and evaluating works of visual art

- Students correlate responses to works of visual art with various techniques for communicating meanings, ideas, attitudes, views, and intentions

Part I: Student group Targeted

10-12 grade high school students

(Requirement: Students have previously taken art technology classes and all students are familiar with Adobe Photoshop)

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Part I: Time Required

Eight classes: per 90-minute period

Lesson 1- two classes

Lesson 2- three classes

Lesson 3- three classes

Part I: Materials

Power Point presentation of Cindy Sherman's and Kehinde Wiley's art, Computers with

Teen Second Life program, high speed Internet connection, tablets with digital pens,

Adobe Photoshop, pencils, papers, color pencils, erasers, rulers

Online sources
http://secondlife.com/
http://www.cindysherman.com/
http://www.kehindewiley.com

Part I: Instructional Plan

Previous art technology classes

Students learned how to use Adobe Photoshop as they created digital paintings

and collage projects using diverse tools such as brushes, clone stamp, eraser, blur,

dodge, selection, pen, and rectangle. With these art technology classes students also

became familiar with how to import files, scan and copy images, and paste these images

into other images using the mouse and pen tablets. In addition, students had an

experience using a blog for an art technology class to post images and write journals.

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Lesson 1 -What is identity and how students define their own identities? (Building basic avatars)

  Objectives

- Students will create their basic avatars and learn how to navigate and communicate with other avatars in Teen Second Life.

- Students will learn about artwork by Cindy Sherman and Kehinde Wiley.

- Students will describe their own identities as they discuss their own interpretations of concepts of identities.

- Students will write a description of the characteristics of their avatars and build virtual identities.

  Motivation

On the first day, the teacher will introduce Teen Second Life by showing students avatars and environments. The teacher will explain how avatars walk, fly, run, communicate, and teleport and how to search for places and avatars in Second Life.

On the second day, the teacher will lead the discussion to help the students think about their identity. Students will fill out the questions on the blog and share 5-10 words describing identity generally and personally. Next, working in groups of 4-5 students, they will share their words with group members and the class. After the discussion, the teacher will show a Power Point presentation of Cindy Sherman and Kehinde Wiley's artworks. After students learn about the two artists, the groups of students will discuss

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and will explain how these artists approach the concept of identities in their work. After the discussion, the teacher will demonstrate how to change the avatars such as body shape and face using tools in Teen Second Life.

Art Activity- day one

As the teacher demonstrates the process of registration, students will register in Teen Second Life and make basic avatars to explore new environments. Next, students will experience walking, flying, running, teleporting, searching, and chatting with other avatars. Students will find the island owned by the teacher for the class and meet with their classmates' and teacher's avatars. Each avatar will explain their good or bad experiences in Teen Second Life through virtual communication.

Art Activity- day two

After students learn about Cindy Sherman and Kehinde Wiley, the students will decide how they will present their avatars with real identities or imagined identities in Teen Second Life. They will write descriptions of their first avatar's identity on papers.

Following the teacher's demonstration of changing appearance, students will practice to change the appearance of basic avatars including body shape, head, eyes, mouth, nose, skin, height, hairstyle, and basic clothing using tools in Teen Second Life. Students will role-play with their avatars by communicating with other avatars in Teen Second Life. Next, students will learn how to work cameras in Teen Second Life and take snap shots of avatars including a whole body, a face detail, or a part that students may consider that is unique. Students will save the snap shots in their folders as a .jpg

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file and post the images on the blog. After posting the images, students will write about the characteristics of their avatars on the blog. The class will present their avatars on a big computer screen and explain characteristics of their avatars. The teacher will lead the discussion concerning how they will build virtual identities with their characteristics including behavior, job, age, race, etc. in Teen Second Life. Students will write down their possible identities and post their ideas on their blog.

Assessment and Rubric

- To what degree were students able to explain the concept of identity?

- To what degree were students able to explain the characteristics of Sherman and Wiley's artworks with identity?

- To what degree were students able to create their avatars using tools in Second Life?

- To what degree were Students able to explain their first virtual identities in Teen Second life?

- Blog question for lesson 1

  o What is identity?

  o What makes your identity different than others? (Gender, race, culture, appearance, environment, characteristic, habit, age, attitude, acting, time)

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-Content/level	1	2	3	4	5 Excellent	Note/ Total
Understand concept of identity (Identities in artists' works and their own) Evaluation -First blog question about identity -Group verbal presentation						
Make connection between their avatars with their own identities or imagined identities (Presenting their avatars for clear reason) Evaluation -Pictures of avatars and written description of first avatars' identities						
Function in Teen Second Life Evaluation -Navigation, changing appearance, role- play, communication)						

Lesson 2- Develop their own avatars to build their virtual identities (using tools and

texture mapping in Second Life)

 Objectives

- Students will draw 2-3 sketches of possible avatars using papers and pencil to

    create their identities.

- Students will develop their avatars and clothing using their sketches, snapshots

    of avatars, and Adobe Photoshop on tablets with digital pencils.

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- Students will compare their avatars with others and describe the characteristics of their avatars and other students' avatars.

- Students will plan their specific clothing using texture templates from Second Life.

Motivation

The teacher will revisit the blogs from the previous class and ask students a few questions about identity. Students will brainstorm about their virtual identities with unique characteristics as they explore Teen Second Life with their avatars and sketch new avatars with new clothing.

Art Activity-day one

Students will draw 2-3 sketches of their avatars on papers and scan these images in Adobe Photoshop. Next, students will open the snapshots of avatars from the previous class. Then, students will develop or change their avatars and clothing using 2-3 sketches and snapshots of avatars in Adobe Photoshop. At the end of the class, students will post the sketches and process of developing clothing and avatars to their blog. Also, students will write feedback about other students' avatars and clothing.

Art Activity-day two

Students will continue to draw their avatars. Next, students will print out their drawings and explain their drawings and identities to the class. Through the discussion with the teacher and class, each student will choose one of the avatars for their virtual identity. Finally, students will draw details of clothing and characteristics in Adobe

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Photoshop. After finishing their drawing, students will print out and write about their virtual identities. The teacher will show all different virtual avatars to the class and each student will describe others' avatars with personal interpretation. After the presentation, students will add these images to their blogs.

Art Activity-day three

After students finish developing their avatars, the teacher will show different parts of templates and explain how to use templates (see Figure1) for texture mapping. Next, students will open the templates and plan details for texture mapping such as what part of the template will be the part of avatars or how many textures they will need for the avatar. Finally, students will make the specific detail plans and save the plans to their folder and post it to the blog.
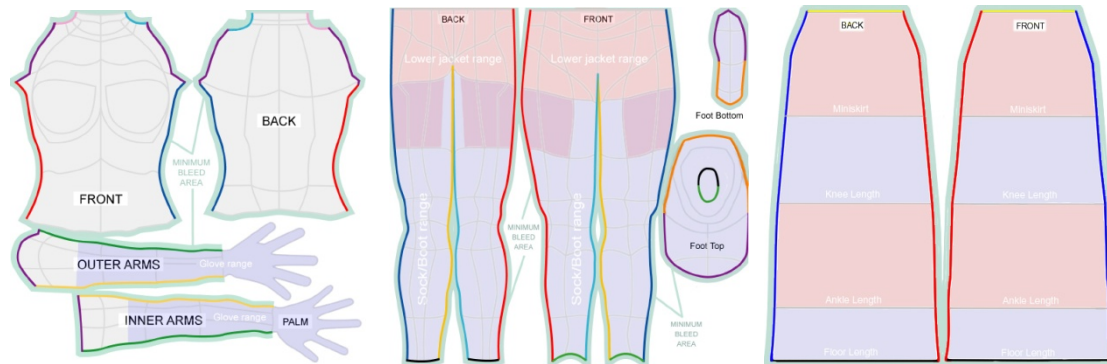

Figure 1. These are templates of different parts of clothing such as an upper body and lower body for pants and a skirt. To create custom clothing, people can download the templates from an official Second Life website.

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Assessment and Rubric

- To what degree were students able to design their own unique characters and
  build their identities using tools in Adobe Photoshop?
- To what degree were students able to create avatars and clothing that reflect
  their virtual identities?
- Blog questions for lesson 2
  - What are a few of the most important aspects of your identity?
  - How could you change your identity?

Content/level	1	2	3	4	5 Excellent	note
Clear explanation of their avatars for their virtual identities Evaluation: -Snapshots, sketches, writing						
Clothing design that reflect their virtual identities Evaluation: -Developed sketches with clothing						

Lesson 3- Texture mapping for their avatars

Objectives

- Students will learn the basic technique for texture mapping for three-
  dimensional characters in Second Life, three-dimensional game, or animation.
- Students will create textures and clothing using templates and Adobe Photoshop

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- Students will follow the steps of texture mapping and create their own avatars with their virtual identities in Teen Second Life.
- Students will describe their avatars' characteristics related to identity as they role-play and communicate with others in Teen Second Life.

Motivation

The teacher will explain the details of what is texture mapping for three-dimensional characters and discuss the plans for texture mapping that students turned in the previous class. Next, the teacher will demonstrate how to apply the complete templates to three-dimensional characters in Teen Second Life.

Art Activity-day one

Students will bring all files such as snapshots of their avatars, textures, developed avatars with new clothing, and planning sketches to Adobe Photoshop. After the teacher's demonstration of texture mapping, students will make textures and clothing using templates from Second Life in Adobe Photoshop.

Art Activity-day two

Students will continue to work on their textures and clothing using Adobe Photoshop. After students finish making textures and clothing (see Figure2), they will apply the texture templates to their avatars in Teen Second Life (see Figure3). Students will make the blog posts about the process of making clothing.
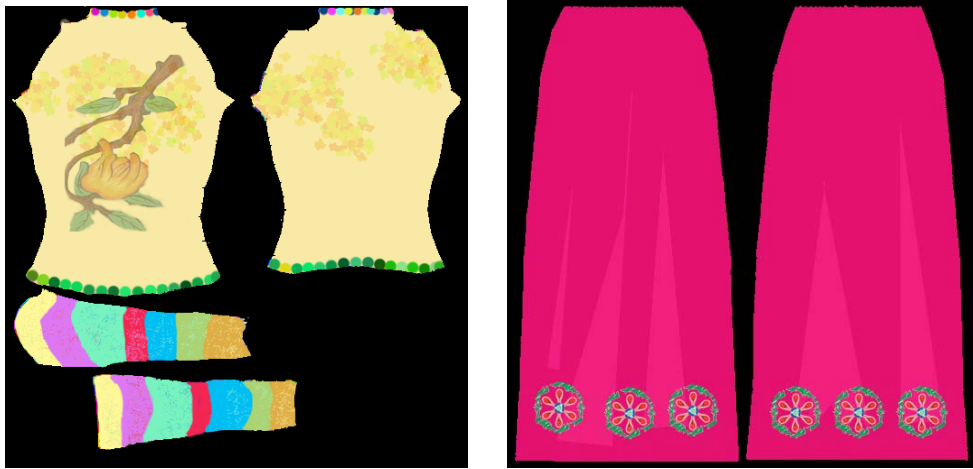
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Figure 2. These images are finished templates of modified Korean traditional clothing before applying to the avatar.

Figure 3. These images show how to apply the new textures to the avatar after upload the completed templates to Second Life.

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Art Activity-day three

After students apply their complete textures and clothing to their avatars, the avatars will make a group with 2-3 avatars. Next, they will discuss and compare their identities to other peers' avatars and role-play their virtual identities in Teen Second Life. With this process, students will give new names to their avatars. Finally, the avatars will take snapshots of the avatars as a class and as individuals. Then, the avatars will present the reasons why they made their virtual identities and will role-play in Teen Second Life. At the end of the class, students will post images of their final avatars on the blog.

Assessment and Rubric

- To what degree were students able to create their unique clothing to build their virtual identities using Photoshop?

- To what degree were students able to understand the texture mapping techniques in Second Life?

- To what degree were students able to role-play related to their virtual identities in Teen Second Life?

- *Blog questions for lesson 3*
    - How does your identity change in different environments such as home and school, or with different people such as friends, teachers, parents, siblings, and relatives?

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o How do you act in situations with different people and environments?

Content/level	1	2	3	4	5 Excellent	Note/ Total
Virtual identities related with their clothing Evaluation: -Avatars and their clothing						
Virtual identity through role playing and clothing in Teen Second Life Evaluation: -Discussion and acting in Teen Second Life						
Understand the techniques (Texture mapping, using tools in Second Life and Adobe Photoshop) Evaluation: -Textures, clothing						

Part I: Overall Unit Evaluation

Assessment

- To what degree were students able to explain the concept of identity?

- To what degree were students able to explain the characteristics of Sherman and

   Wiley's artworks with identity?

- To what degree were students able to create their virtual identities and explain

   their self-identities or imagined identities in Teen Second Life?

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- To what degree were students able to design their own unique characters so that they can build their identities using tools in Second Life and Adobe Photoshop?

- To what degree were students able to role-play using their avatars with virtual identities as they communicate with others in Teen Second Life?

Rubric

Contents / level	1	2	3	4	5 Excellent	Note/ Total
Understand concept of identity (Their own identities, how the artists present their identity)						
Presenting identity in Teen Second Life (Avatars with identity, characteristic of designs, reflective their identities in Teen Second Life)						
Using Second Life and Adobe Photoshop as a tool (Navigation, understand structure of Second life, changing body shapes and clothes, coloring, using function in Teen Second Life)						
Clothing design for their avatars (Proper texture mapping for their clothing, clothing reflect their identity)						
Blog journals, feedback to others						
Participation and proper behaviors in a real classroom and Teen Second Life.						

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Part II: Unit overview

Living in a society provides opportunities for people to interact and communicate with others. Also, as members in society, it is necessary to have their own roles and understand them in the context of identity. Also, collaboration with members of society is an essential element for building community.

In this unit students will extend their identities through artwork and gallery environments in Teen Second Life. Through this process, students will consider how to present their artwork, which reflects their identities, in public environments. Also, the students will experience collaboration through building their own galleries with peers in Teen Second Life. This unit will help students learn ways to interact with others and to solve problems in collaboration. Moreover, writing journals through a class blog will help students communicate with peers and teachers and understand their projects of process.

The goals of this unit are to help students build their identities through their own artwork, create an environment for displaying their artwork in Teen Second Life, collaborate with peers to solve problems, and learn 3D creation tools in Teen Second Life.

As societies become more complex than before, it is necessary that students have many opportunities to present their identities and to collaborate and interact with others to live. Therefore, this unit will help students understand how to present their

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identities as a person and group as they create their artwork and galleries in Teen

Second Life and how to solve the problems working as a group.

Part II: Big Idea– Display their identities-gallery project

Key Concepts

- Identities can be represented through art.

- A personal symbol can express identity.

- Depending on the environment being presented, artworks can have different

  meaning and concepts.

- Identities of an individual and society can be changed in different environments.

Essential questions

- What kinds of artworks can reflect your virtual identity?

- What kind of symbols can represent your identities?

- What makes a personal or group identity different than others?

- How is a group identity different from a personal identity?

- How can artwork be presented in different environments and how does this

  change the meanings of the artwork?

Part II: Unit Objectives

- Students will learn the basic 3D tools in Second Life as they create objects for

  their avatars.

- Students will write about how Cindy Sherman and Kehinde Wiley's artwork can be presented in different environments and how the meaning of artworks can be changed.

- Students will create virtual artworks that reflect their identities.

- Students will create their group and individual identities as they build galleries in Teen Second Life.

- Students will understand a problem-solving skill through collaboration.

- Students will compare their galleries or environments with others and discuss differences of galleries with distinct characteristics.

Part II: Standards of Learning

National Standards for Art Education

<u>Content Standard # 1:</u> Understanding and applying media, techniques, and processes

- Students apply media, techniques, and processes with sufficient skill, confidence, and sensitivity that their intentions are carried out in their artworks

- Students conceive and create works of visual art that demonstrate an understanding of how the communication of their ideas relates to the media, techniques, and processes they use

- Students communicate ideas regularly at a high level of effectiveness in at least one visual arts medium.

<u>Content Standard # 2:</u> Using knowledge of structures and functions

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- Students demonstrate the ability to compare two or more perspectives about the use of organizational principles and functions in artwork and to defend personal evaluations of these perspectives

- Students create multiple solutions to specific visual arts problems that demonstrate competence in producing effective relationships between structural choices and artistic functions

Content Standard # 3: Choosing and evaluating a range of subject matter, symbols, and ideas

- Students reflect on how artworks differ visually, spatially, temporally, and functionally, and describe how these are related to history and culture

- Students apply subjects, symbols, and ideas in their artworks and use the skills gained to solve problems in daily life

- Students evaluate and defend the validity of sources for content and the manner in which subject matter, symbols, and images are used in the students' works and in significant works by others

Content Standard # 4: Understanding the visual arts in relation to history and cultures

- Students describe the function and explore the meaning of specific art objects within varied cultures, times, and places

- Students analyze relationships of works of art to one another in terms of history, aesthetics, and culture, justifying conclusions made in the analysis and using such conclusions to inform their own art making

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Content Standard # 5: Reflecting upon and assessing the characteristics and merits of their work and the work of others.

- Students identify intentions of those creating artworks, explore the implications of various purposes, and justify their analyses of purposes in particular works
- Students correlate responses to works of visual art with various techniques for communicating meanings, ideas, attitudes, views, and intentions

Part II: Student group Targeted

10-12 grade high school students

Part II: Time Required

Twelve classes: per 90-minute period

Lesson 1- two classes- making object for their avatar (for practice objects)

Lesson 2- four classes- making their artworks reflect their identities

Lesson 3- six classes- creating environments for their artworks

Part II: Materials

Power Point presentation of Cindy Sherman's and Kehinde Wiley's art, Computers with Teen Second Life program, high speed Internet connection, tablets with digital pens, Adobe Photoshop, pencils, papers, color pencils, erasers, rulers, papers, pens.

Part II: Instructional Plan

Lesson 1 –making objects such as accessories for their avatars

    Objectives

- Students will learn tools such as position, rotate, and stretch for making objects in Teen Second Life.

- Students will learn how to use a grid system and apply textures to make their objects in Teen Second Life.

- Students will create their objects such as accessories, guitars, glasses, bags, etc. that reflect their identities in Teen Second Life.

- Students will learn how to attach the objects to their avatars.

- Students will discuss why and how they create their personal objects with peers in Teen Second Life.

    Motivation

The teacher will demonstrate how to make objects using tools such as position, rotate, and stretch in Teen Second Life. Students will follow the steps making simple objects. The teacher will explain how to use a grid system tool for making different 3D models such as cubes and cones correctly. After the demonstration, the teacher will lead a discussion to help the students brainstorm what objects students can create to reflect the identities of their avatars.

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Art Activity- day one

First, students will learn the tools in Teen Second Life and follow the teacher's demonstration. After that, students will explore the tools to make different types of objects. Students will practice making and combining shapes and models before designing their objects. Next, students will design their objects that reflect avatars' identities and draw 2-3 sketches before making their objects. At the end of the class, students will post sketches with ideas to the blog and write about their experiences in making models.

Art Activity- day two

Students will create objects such as musical instruments, necklaces, bracelets, glasses, computers, etc. to reflect aspects of their identities. Then, students will make textures for objects and apply the texture to the objects. Next, students will attach the final objects to their avatars (see Figure 4). After the creation, students will share their ideas about objects and techniques of using the tools with their peers in Teen Second Life and in the classroom. Students will post pictures of the objects they created on the blog.
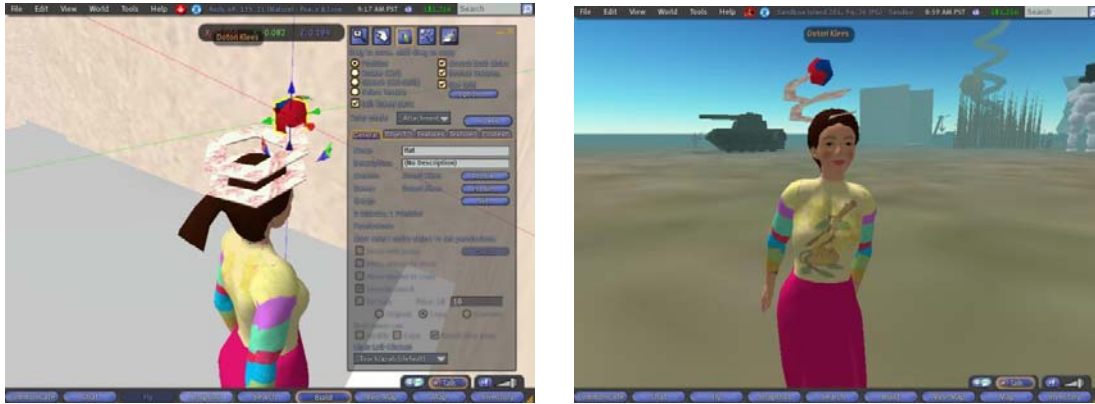
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Figure 4. These images show an example of object to represent an identity as Korean using the hat.

Assessment and Rubric

- To what degree were students able to understand how to use 3D tools in Teen Second Life?

- To what degree were students able to create about their objects related with their identities?

- To what degree were students able to explain why and how to make their objects?

- Blog questions for lesson 1
    - What is the main reason to make an object for your virtual identity?

-Content/level	1	2	3	4	5 Excellent	Note/ Total
Understand how to use 3D tools in Teen Second Life Evaluation: Practicing shapes and 3D models.						

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Make connection between their objects and identities Evaluation: Clear reasons for creation of objects from discuss, sketches of brainstorm						

Lesson 2- Create artwork that reflects their identities

  Objectives

- Students will draw 3-4 thumbnail sketches and choose one sketch for the artworks.

- Students will develop their artworks such as sculptures, digital paintings, crafts, and graphic designs and draw specific planning such as forms, colors, shapes, texture, etc.

- Students will present their ideas of artwork such as reasons to make to the class.

- Students will make their artwork using tools in Teen Second life and Adobe Photoshop.

- Students will create textures and apply these to their artworks.

- Students will discuss their artwork including techniques and reasoning to make as a group in Teen Second Life.

- Students will present their artwork to the avatars of peers in Teen Second Life.

  Motivation

    The teacher will lecture on artwork that reflects their identities such as paintings,

sculptures, crafts, etc. The teacher will lead a discussion about possible artwork that

each student can create reflecting their identity. The topics of the discussion should include: gender, culture, hobbies, and race. After the discussion, students will brainstorm which forms of art they will choose and share their ideas as a group in Teen Second Life.

   Art Activity-day one

   Students will draw 3-4 thumbnail sketches to get ideas for their artwork. After drawing a few sketches, students will discuss their ideas with the teacher and choose one sketch for their artworks. Students will develop the selected sketch by drawing their artworks such as paintings, sculptures, and crafts with specific plan including colors schemes, type of models, shapes, textures, etc. At the end of the class, students will post their ideas and sketches in the class blog and they will give suggestions to their peers.

   Art Activity-day two and three

   At the beginning of the class, students will write their opinions about peers' ideas and get feedback from their peers and the teacher through the blog. Then, students will take advice and make their artworks using 3D tools in Teen Second Life. Students will create textures using Adobe Photoshop and apply the textures to their artwork.

   Art Activity-day four

   Students will finish their artworks (see Figure 5). The students' avatars will make few groups and discuss their artwork in Teen Second Life. For example, questions may include what techniques did they use for their artworks and why did they create their specific artworks? After the discussion, each avatar will present ideas and

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techniques of using tools to the avatars of their peers and the teacher in Teen Second

Life.

Figure 5. These images show an example of artwork of the avatar. The shapes of artwork represent nature with diverse properties.

Assessment and Rubric

- To what degree were students able to reflect their identities through their

  artworks?

- To what degree were students able to explain the ideas of the artwork to the

  class?

- To what degree were students able to use the tools in Teen Second Life?

- Blog question for lesson 2

  - What kinds of artworks can reflect your virtual identity?

  - What kind of symbols can represent your identity?

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Content/level	1	2	3	4	5 Excellent	note
Reflective artworks of their identities (Developed sketches for their artwork-color schemes, subjects, reason for create their artworks)						
Using tools and techniques in Teen Second Life (Craftsmanship of the artwork)						
Presentation of their artwork in Teen Second Life (Clear presentation of their artwork, problem, technique)						

Lesson 3- create environments for their artworks

    Objectives

- Students will learn how artworks are presented in different settings depending on the purposes of artwork and artists.

- Students will form small groups and discuss how they make their environments or galleries for their own artworks in Teen Second Life.

- Students will design their environments with a specific plan such as an indoor gallery, sculpture garden, etc. for their artworks in Teen Second Life.

- Students will create their environments and display their artwork at the environments as a group and as individual, in Teen Second Life.

- Students will explain why they created their environments and how they relate to the artwork.

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Motivation

The teacher will show Cindy Sherman and Kehindy Wiley's artwork. The teacher will lead a discussion how the artworks can be presented in different environments and how meaning of artworks can be changed depending on various surroundings such as on streets, galleries, nature, magazines, books etc. After the discussion, students will brainstorm how they can present their artworks to the public in Teen Second Life.

Art Activity-day one and two

Students will make groups and discuss how they could present the artworks and what environments they could create for displaying the artworks. First, students will consider each artwork of a group member and then think how they build their environments for their artworks as a group. On a large sheet of paper, students will design their specific plans for environments or galleries. Also, students will have roles for the planning and development of this collaborative space. After designing, they will present their plans to the class to get feedback from peers and the teacher. At the end of the class, students will post their plan with an explanation on the blog.

Art Activity-day three, four, five

Students will create their environments in Teen Second Life (Figure 6). Students will make a surrounding for an individual artwork and then they will work as a group for an entire setting in a theme that they plan. At the end of each class, students will write journals and post the process of creation on the blog.

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Figure 6. These images are the steps to build an Asian style gallery for the artwork.

Art Activity-day six

Students will finish their environments and display their artworks in their environments in Teen Second Life (see Figure 7). The avatars will visit different environments or galleries and then avatars will explain why and how they made the specific environments for their artworks and what difficulties they encountered when building environments in Teen Second Life.
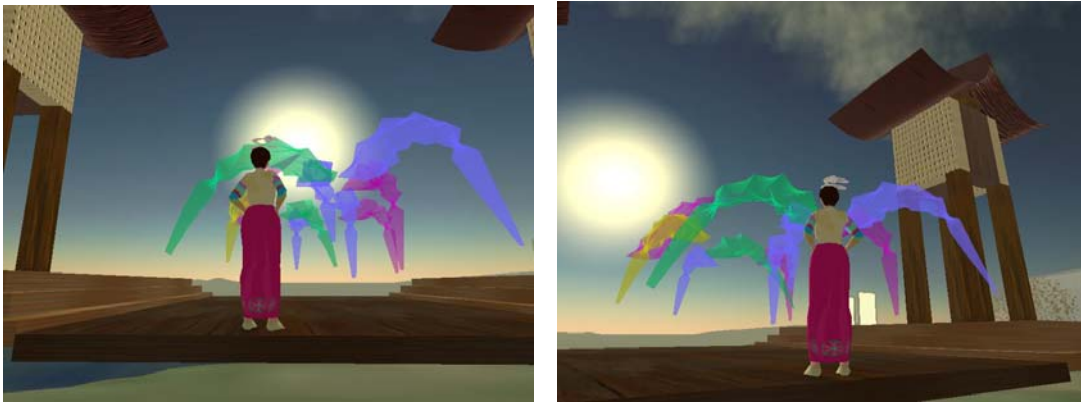

Figure 7. These images show a final production of a gallery with displaying artwork.

Assessment and Rubric

- To what degree were students able to explain why they built a part of the environment for an individual artwork and an entire environment as a group?

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- To what degree were students able to plan and build their environments for presenting their artworks as a group in collaboration?

- To what degree were students able to understand the tools in Teen Second Life?

- To what were students able to present clearly reasons for their environments to the public in Teen Second Life?

- Blog question for lesson 3

  o What makes a personal or group identity different than others?

  o How can the artwork of artists be presented in different environments and how can meanings change?

Content/level	1	2	3	4	5 Excellent	Note/ Total
Clear explanation of their environments related with their artworks. Evaluation: An individual artwork and environment						
Collaboration Evaluation: As a group, how they present their artworks together and make environments for the artwork-big sketches for plan.						
Using tools in Teen Second Life Evaluation: Their responsibilities to create their environments-as a modeler, painters etc.						

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Group presentation. Evaluation: Presentation to public their artworks and environment as a group in Teen Second Life.						

Part II: Overall Unit Evaluation

Assessment

- To what degree were students able to create their objects that reflect their

  identities?

- To what degree were students able to explain the concept of their artworks?

- To what degree were students able to explain their artworks and environments

  with clear concepts?

- To what degree were students able to understand the tools in Teen Second Life?

- To what degree were students able to collaborate with peers as a group?

Rubric

Contents / level	1	2	3	4	5 Excellent	Note/ Total
Understand and make connection between their virtual identities and objects (How they build their ideas and make their objects)						

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Clear concepts of the artworks that reflect their identities (Ideas of artworks, process of creation, final artworks)						
Creation of environments for their artworks (How the environments are presented with their artworks, final environments)						
Collaboration Problem solving, team works						
Using Teen Second Life and Photoshop as a tool. (How they build their objects environments and textures using tools in Teen Second Life and Photoshop correctly)						
Blog journals and feedback to others						
Participation and proper behaviors in a real classroom and Teen Second Life.						

Conclusion

As this chapter presents, students will use Teen Second Life to learn about the

concept of identity. Through these units, students may consider and build their own

identities as members of societies. Also, they may experience new ways to interact with

others and create artwork using diverse tools in Teen Second Life. Then, students will

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create artworks that reflect their identities and present their work in a public environment using tools in Teen Second Life.

These units may help students to consider the concept of extended identities as making their objects, artworks, and environments that relate with their virtual identities. Through these units, students may experience a virtual society as they communicate and work with peers. In addition, students may learn how to create basic 3D models and texture mapping using tools in Teen Second Life and may build their artistic abilities through this project. Furthermore, this virtual experience to construct their identities may help students to recognize and build their identities in a real society.

CHAPTER 4

This thesis project presents the concepts of VR and diverse use of VR for an educational environment. Also, the units show the possible use of VR for an art educational environment as students experience Teen Second Life, which is a VR on-line community.

In chapter 1, I give a brief introduction of this thesis project including what VR is and how this technology may be used for educational environments. In addition, I raise questions including, as art educators, how we can use this VR for secondary students in art classes and why would we bring new technology to art classrooms for students' learning? Furthermore, I suggest that art educators may consider further research areas such as conducting a survey about VR technology to art educators, working with a university to create VR for children, doing case study to develop VR using available software, and using VR for students with special needs.

In chapter 2, I examine the brief history of using technology in general education and art education. Technology in educational environments has not always been used successfully because of the difficulties of using facilities or high cost, even though many educators have tried to use new technologies. Then, I focus on the use of VR for educational purposes in general and specifically for art educational purposes. I

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investigate the definition of VR, which allows users to navigate and explore graphics and sound in computer-generated spaces with an interactivity, history, application, and characteristics of VR technology. Also, I examine how characteristics of VR such as immersion and interactivity make VR unique compared to other technologies. Next, I demonstrate how VR is used for educational and art educational purposes and what advantages and disadvantages VR has for educational purposes. For instance, VR gives students the opportunity to learn actively so that they may understand content more easily as compared to learning a traditional classroom. On the other hand, using a new technology may be problematic without a specific plan such as a reason to use VR technology, a good design, a high quality of graphic element, and a specific target group. In addition, I introduce the on-line VR community Second Life. As I examine this on-line virtual world, I found out that educators have used Second Life for many areas such as medicine, science, math, history, culture, and students with disabilities to improve education. Also, some educators have used Second Life for the virtual lecture rooms and creation tools to help students' learning. Furthermore, there are possibilities to use Second Life in art education because of its visual production such as 3D modeling and textures.

Chapter 3 presents the units for high school students using Teen Second Life. The purpose of these units is that students create their identities by creating avatars and clothing in Teen Second Life. In the first part, students make their avatars and explore Teen Second Life. Then, they develop their avatars as they create their clothing using

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the templates and Adobe Photoshop. Through this virtual experience in Teen Second Life of building their identity and finding their roles, students may understand themselves in society. Also, using the tools in Teen Second Life helps students learn basic 3D texture mapping. In the second part, I present the unit to help students continue building their identities. First, students make objects for their avatars to represent their identities and to understand how to build 3D models using tools in Teen Second Life. Then, they create an artwork that reflects a virtual identity and display their artwork in virtual spaces as groups. This process may help students consider extended identities and experience how to communicate and interact with others in a virtual and real society.

Using VR for art educational environments is a starting point. It is important that art educators have options to use this technology in art classes. As I presented before, VR technology can be used as tools for communication and interaction with others. Also, VR technology engages users with highly visual-based 3D environments which are important elements in art. More importantly, art educators should understand what the advantages and disadvantages of using VR and Teen Second Life are. Students who play computer games are more likely to enjoy the process of creation. However, some students who do not have fine motor skills may have a hard time using digital tablets, digital pens, and a mouse. In addition, art educators who want to use Teen Second Life should learn basic 3D modeling skills using diverse tools and understand how this on-line virtual world works for students. It is possible that students may face unexpected

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verbal violence or harassment in the on-line virtual community. Therefore, as art educators, it is necessary to provide students a safe environment such as a land owned by an art teacher for an art class. Also, it is important to teach them to respect others when they are in an on-line virtual world. Then, students may enjoy time in VR environments and learn about communication and art creation.

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Resources- Artist research

    Cindy Sherman

    Cindy Sherman is the late twentieth century photographer, actress, model and film director who presents herself as a medium for diverse issues in modern society. She was born in 1954 in Glen Ridge, New Jersey of New York City and after high school she studied painting in State University College at Buffalo. However, she frustrated about painting and decided to work as a photographer with her idea. In Buffalo, she formed Hallwalls, an independent artists' space with her fellow artists Robert Longo and Charles Clough for fellow artists. Sherman typically photographs herself with diverse roles of the woman in the society. In Sherman's well-known photographs 'Untitled Film Still' (1977-1980), she showed herself as a B-movie actress with costumes such as wings, hats, dresses, and clothes, performing different characters. The works showed the sense of her personality but most of her works did not depict Cindy Sherman's personality by titling her work "Untitled" for depersonalizing the images. Sherman has connected various visual genres such as the film still, centerfold, fashion photograph, and historical portrait.

Her works had been presented her works in Stedelijk Museum, Amsterdam, in 1982 and the Whitney Museum of American Art, New York, in 1987. She lives in New York and does her artworks.

Kehinde Wiley

Kehinde Wiley is a portrait painter who lives in New York. His portrait paintings present the visual rhetoric of the heroic, powerful, lavish, majestic and splendid of young, urban black man. In his web gallery biography (n.d.) shows

> Wiley presents his young men as both heroic and pathetic, aestheticized and reified, autonomous and manipulated. Ultimately, Wiley's practice disturbs and interrupts tropes of portrait painting to locate, in his words, "class struggle at the level of sign" (Bio Artist statement, ¶. 2).

In his painting he combines French Rococo, Islamic architecture, and West African textile design to create his own style. His portrait paintings are life size figures and use photographs of young man from the street of Harlem. Also, the poses of his portraits present contemporary hip-hop culture with Renaissance paintings. He explains his approach as "interrogating the notion of the master painter, at once critical and complicit" (Artnet, 2009, ¶. 5). His paintings combine history and contemporary style.

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Sohhyoun Yoon was born in Seoul, Korea. She received BFA in Print making at Hongik University in Seoul. When she was attending the program Master of Art Education at VCU, she presented her journal unit with her classmates at VAEA 2006 and the topic of Second Life in Art Education in Student chapter NAEA 2007, New York. Also, she presented the topic of web 2.0 with her advisor Dr. Buffington and classmates at VAEA 2007 and Williamsburg, NAEA 2008, New Orleans. Also, she received the scholarship at State Council of Higher Education in Virginia 2007-2008. She taught CAT's CAMP 2008, 2009 summer.