CHAPTER 2

REVIEW OF THE LITERATURE

2.1 Introduction

This section explores various text-based and graphics-based technologies commonly used to enhance learning. Both 2D and 3D tools are described and compared to find out what educational benefits they can provide. Constructivism and theories of multiple intelligences, creativity, and motivation are examined to see how they relate to each other, and to the kind of learning environments that virtual worlds might be able to foster. Finally, recent studies of virtual worlds used in education are described to see what they have focused on, what they have neglected, and what important issues should be considered when using them.

2.2 Technological Studies

Because this study deals with using technology to motivate students in a language learning environment, it seems reasonable to look at how others have used various technologies and the lessons that can be learned from that research.

Technology has been used in education for many reasons and purposes. Increasing students' motivation toward learning, making education more collaborative or effective, providing better or more timely information, and changing educational goals to fit societal needs and standards are a few obvious uses and examples.

Technology itself is continually changing and is not a homogenous concept. There are possibly as many kinds of technology as there are educational teaching methods or theories of education. This study will look at several types of technologies that have already received the scrutiny and acceptance of members of the academic community, as well as technologies that have only recently started to be considered for educational usage.

There is overlap between various types of technology, and it is difficult to put a certain technology into a specific category because any particular software type may integrate or exclude certain functions which make it different from other similar kinds of software. This is analogous to the difficulties in comparing textbooks on a certain subject. Take biology for example, whereas one textbook may emphasize colorful illustrations and include a multimedia CD; another might concentrate on more mathematical exercises, essay questions, and test preparation. While both books attempt to inform learners about the same subject, they approach it from different perspectives.

A starting point for understanding various technologies from the framework of this proposal might be to look at how these technologies have been used in education and their relevance and implications toward a conversation class setting. Due to the ever changing and evolving nature of technology my intention is to focus, whenever possible, on newer technologies which are more suitable for today's tech-savvy student population.

2.3 Text-based Tools

Message boards, blogs, wikis and chat are similar in that they are predominantly text-based. They vary in terms of interactivity, degree of collaboration, and whether the communication takes place in real time or asynchronously.

Message Boards and Blogs

Bishop and Doiron (2004) designed an online course to investigate the effectiveness of online discussions for stimulating learning and their acceptability to students and staff as a substitute for face-to-face discussion groups. They found participation in the discussions was high and the quality of the discussions also appeared to be favorable with a relative minimum of

off-topic conversation. Students enjoyed the asynchronous flexibility of using the forum discussion boards at times that were convenient for them.

Borja (2005) pointed out that while it is unknown exactly how many education related blogs exist, their use in classrooms has increased from only a few a year or so ago to current usage in the thousands. She said that students are interested in using blogs because there is the potential that millions of people will read what they write. Therefore, they are also more careful with their grammar and logic than they would be on a written assignment which only the teacher would see.

As a suggestion to those thinking about using blogs as an educational tool, some blog experts recommend not hosting blogs on third-party web sites due to the inability to provide sufficient oversight and control (Borja, 2005).

Wikis

Wikis are similar to blogs and message forums in that they are text dependent, and are also commonly used asynchronously. A wiki (derived from the Hawaiian word for "quick") is a collaborative web page. Therefore they have some of the same capacities for reaching a world-wide audience and stimulating motivation as blogs and message forums. The major differences between them are in the areas of editing and collaboration.

Wikis have been used for a wide range of educational and administrative purposes. Besides providing an online space for student writing assignments, Engstrom and Jewett (2005) said that wikis are commonly used as personal information managers (PIMs), knowledge bases or knowledge management systems, sites for collaborative authoring of a document or project development, content for academic instruction, and collaborative communication forums.

They have been used in educational activities ranging from creating an online law course to creating platforms for the discussion of Shakespeare plays (Robinson 2006). Richardson (cited in Jakes, 2006) suggested that teachers and students collaborate to create wiki textbooks for individual courses, and that each year new classes might add or edit content.

Allison (2005) found not only that his students learned advanced collaborative social skills when using a wiki but they also learned effective writing strategies and grammar from other students (cited in McPherson, 2004). This resulted in his students developing deep understandings and strong social bonds among themselves. Likewise, Achterman (2006) mentioned that the collaborative environment that wikis facilitate can "teach students how to work with others, how to create community, and how to operate in a world where the creation of knowledge and information is increasingly becoming a group effort" (p. 74).

Achterman reported five common features of wikis: (1) ease of use, (2) space to create products, (3) ability to create a nonlinear document structure through hyperlinks, (4) mechanism for reflection, and (5) the means for tracking progress. While these features are similar to those expressed by Lamb (2004), Achterman added the feature of being able to track progress. Because revisions are routinely archived and made accessible, it is relatively transparent to see the process and changes that the wiki has undergone. Robinson (2006) was particularly interested in this ability to keep track of the document as it is being revised.

As a word of caution, wikis are not an educational panacea. They have their own drawbacks and should be used carefully and purposefully. When using wikis to promote student writing, McPherson (2006), cautioned that the collaborative nature of students working with other students may actually worsen students' reading and writing difficulties. He also mentioned that students may not be familiar with how to collaboratively work with others.

Grant (2006) suggested that perhaps teachers can model correct collaborative practices by participating with the students in their wikis or by having new students join wikis that already exist so that they can learn from more experienced student members. Engstrom and Jewett (2005) said that teachers could improve student collaboration and wiki implementation by arranging students into cooperative groups and having them assume specific roles, such as "discussion facilitator" or "wiki recorder" (p. 15).

Finally, issues of security and privacy are important areas of concerns. Borja (2006) stated that experts suggest that schools use secure wiki software that is compatible with their districts' technology systems, and that educators protect their school wikis with passwords.

Chat

Lacina (2005) said that Internet chat sessions can provide ESL students with authentic language use. When students use Internet chat software, they do not have to be worried about mispronunciation, and they are better able to understand the complete conversation because they can read and reread the text.

Mynard (2002) reported that research suggests there are a variety of benefits for students engaging in synchronous Computer Mediated Communication (CMC) activities in the areas of student participation, learner control, motivation, and interactive competence.

She noted the possible reasons for those increases in learning: (1) as shyer students feel more comfortable, they tend to participate more; (2) as the teacher's role is minimized, learners take more control; (3) as students engage in a real language activity, they develop interactive competence; and (4) as students perform a new type of activity, their motivation increases.

Mynard also made the suggestion that it may not be appropriate for students to come into contact with strangers. In which case, private chat rooms, hosted by the school itself, would provide more security and control.

2.4 Graphics Based Tools

Simulations, games, videoconferencing and virtual worlds all focus on images to aid in communicating information, and in increasing users' interest and motivation. While text based tools may allow for the inclusion of images, graphics based tools depend on them for their functionality.

Simulations and Games

Simulations and games have primarily been used in education to help motivate students, and to provide an authentic, immersive learning environment. For deep understanding, Zemelman, Daniels and Hyde said that adult learning activities must be broader than demonstrations or training to use a new tool; activities must engage participants in experiential events and supportive groups to help them see themselves in new ways (cited in Brown, 2004).

Wise et al. (2005) detailed research from the Colorado Literacy project involving virtual communication partners which included the "Baldi" project. Baldi (presumably named for his lack of hair) is a 3D talking head with accurate visible speech, and was used to teach vocabulary to children with profound hearing loss. Students talked about Baldi as if he were a real person that was patient with them and helped them learn. This research provided evidence that virtual characters can provide engaging, enjoyable and effective learning experiences.

Online simulations are interactive, high-quality examples, which can give students direct experience related to specific topics. "SimFurnace" is a web-based simulation program which was designed to enable students to dynamically manipulate the inputs of a crude oil furnace in

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the upstream end of a refinery. While manipulating the fuel feed and feed flow rates of the system, students were able to observe the system's responses (Rajagopalan, Doiron, & Song, 2004).

Yang and Alty (2002) stated that web-based simulations can provide students with a wide range of experiences in a safe and efficient manner. They said these experiences were risk-free, obtainable at minimum cost, and allowed students to explore non-standard solutions.

Games are considered to increase motivation through play, interactivity, and challenge. Play helps for more efficient learning and increased cognitive intake. Interactivity is an essential component of games, and for a game to be effective the challenge level of a game must not be too high, or the player would become frustrated, or too low, or the game would be too boring (Vogel, Greenwood-Ericksen, Cannon-Bowers, & Bowers, 2006). Vogel et al. (2006) implied that games designed to enable learning should rely on a simulation-based approach rather than the linear and structured methods present in traditional in educational environments.

In the 2003 Pew Internet & American Life Project, Steve Jones surveyed college students' relationship to gaming. Among the findings were that seventy percent of college students reported playing video, computer or online games at least once in a while. About two-thirds (62%) of gaming students, in line with college students in general, reported studying for classes no more than 7 hours per week.

Forman et al. (2004) interviewed leading-edge thinkers in the field of video games and higher education. These experts said that the Pew report shows that students don't spend a lot of time on books or studying outside of class. Moreover, the study stated that students have detached themselves from the traditional educational experience, partly because they see high school and college as out-of-date in terms of how learning works. These experts felt there is a

usefulness that arises out of playing games. A sense of community is created while playing games, and that gamers have to communicate with each other in order to solve complex decisions. They said that multiplayer games foster completion and cooperation in interesting ways.

In addition, these experts thought that it would be interesting and useful if students were required to write software instead of papers. They would have to use their knowledge to build a gaming environment related to specific topics, such as electromagnetism. They also believed that universities will have to evolve toward this direction because the kids and the market will demand it. However, they feel that this kind of innovative teaching won't happen in schools like Princeton or Harvard; it is going to come from small colleges that want to remake themselves in order to become competitive.

Video Conferencing and Virtual Worlds

Videoconferencing has been used in educational settings since the early 1990s. There are many kinds of videoconferencing ranging from one-to-one meetings or group-to-group discussions to teacher-to-group lectures (O'Dowd, n.d.). Many times videoconferencing is used in a distance education environment. Because of technical problems, high hardware costs and low quality images and audio considerations, many researchers have cautioned against using videoconferencing to provide lectures (Greenberg, 2004; Nayman, 1999). This is due, in part, to people being overly used to seeing "talking heads" on television. Greenberg (2004) went on to mention that for videoconferencing to be effective, it has to be designed to be as interactive as possible.

Rummel and Spada (2005) researched how instructing participants on how to collaborate can improve video conferencing interactions and decision making. However, there are also many

studies showing the problems with using telecollaboration in educational settings. O'Dowd and Ritter (2006) said that telecollaborative communicative exchanges frequently failed. They said that the intended pedagogic and linguistic aims of online interaction were repeatedly missed, and that projects may end in low levels of participation, tension between participants, or negative evaluations of a partner group or culture.

Virtual Worlds

Virtual worlds can be viewed as having some of the same characteristics of text-based collaborative systems combined with the immersive qualities of graphically added collaborative systems. This increases their potential effectiveness for use as an educational tool.

An early virtual world system developed at Carnegie Mellon University was called NetICE. Although this project is no longer being developed, it had hoped to improve upon the communication offered by video conferencing. Video conferencing technology lacks the sense of immersion because each participant sees other participants in separate windows, thus it is often difficult to tell who is talking to whom (Leung, Goudeaux, Panichpapiboon, Wang, & Chen, 2000).

In NetICE, smart terminals connected by a dedicated intelligent network provided an immersive environment to the end users by using audio-visual communication and 3D computer graphics animation techniques. Participants could see each others avatars, hear them speaking through a microphone system, see the avatars lips move, and observe avatars gestures.

Since the early days of virtual world research and evaluation, many more virtual worlds have come and gone, with even more being currently developed and promoted. Betsy Book organized and maintained a web site called "Virtual World Review" (Book, 2006). On those web pages she discussed various online virtual worlds. By the time that she stopped updating the

pages in 2006, she had listed and reviewed twenty-eight different online virtual worlds. However, most of the current literature written and available surrounds three influential commercial virtual worlds, Active Worlds, There, and Second Life, and one ambitious educational virtual world platform, Croquet.

While virtual worlds are as varied as any other type of communication platform, Book listed six features of virtual worlds which they all have in common: (1) Shared Space, (2) Graphical User Interface, (3) Immediacy, (4) Interactivity, (5) Persistence, and (6) Socialization/Community. In order to make some sense out of the concepts and literature regarding virtual worlds, I use these categories to summarize some of the important information and issues.

1. Shared Space: the world allows many users to participate at once.

Since learning is social as well as intellectual, individuals can benefit from the encouragement and collaborative functions of working within larger groups. Virtual communities can provide peer tutoring and emotional support to their members (Dede, 1995).

One device that virtual worlds use to provide realism and interactivity is that of the avatar. The term avatar, is a concept from Hindu mythology that means "the incarnation of a god" (Noguchi, 2005). An avatar is a virtual representation of self. Participants in virtual worlds carry out their interactions using virtual bodies that range from human-looking to abstract forms.

The number of users any particular world can accommodate varies according to hardware and software issues, Internet bandwidth connection limitations, and economic constraints of the world owners.

Bruno (2006) said that Second Life has more than 1.5 million members now, with an average of 10,000 members online at any given time. He went on to say that analysts expect

Second Life to have 9 million members by June, 2007. Some people have criticized this number of members data as being inflated due to the difference between trying (signing up) and actually using it on a routine basis. Regardless of the actual number of users, Second Life has recently gained a lot of visibility in the press.

2. Graphical User Interface: the world depicts space visually, ranging in style from 2D "cartoon" imagery to more immersive 3D environments.

While the most immersive and realistic environments tend to be three dimensional, there are two dimensional worlds that provide social and educational functions. Preece and Maloney-Krichmar (2005) said that virtual communities can be understood by examining the ordinary activities of their participants.

Soukup (2004) observed activities that occurred in a virtual environment called the Palace. This virtual community is composed of hundreds of linked palaces which in turn are composed of many linked room. The Palace is a 2D graphical interface of static background images where movable user avatars can text-chat with each other and travel to different rooms. He found that if these room spaces were visually similar to those of actual places, for example a pool or a casino, then the avatars roles and behaviors remained relatively consistent with those associated with face-to-face interactions. In other words the setting effected the interaction of the participants of the virtual world. However, unlike in real situations, users could easily change the appearance of their avatars. Therefore, participants were not fixed to a set identity and could perform roles unavailable in face-to-face interactions.

3D environments can make for a complex and intriguing environment that can go beyond the limitations of reality. John Lester, community and education manager at Linden Lab,

explained that being in Second Life is a slightly surreal experience; you could be walking down an ordinary street and suddenly see a dragon soaring overhead in sky (Lamb, 2006).

It is this ability to enter into the realm of imagination that has caught the interest of many learning institutions. Graetz (2006) said this can be seen by looking at students' relationships with online gaming. Information content in education is shifting from the classroom lecture format to online collaboration and discussion. Students spend a lot of time online in virtual worlds that emulate multidimensional environments, such as the environments in Warcraft or Second Life. This attitude is echoed in studies that report that seventy percent of today's college students play video games (Pew Internet & American Life Project, 2001). The technologies used to produce video games are closely associated with desktop virtual reality (Tiala, 2007).

Lamb (2006) mentioned that over sixty schools and universities have already set up a presence in Second Life. In the fall of 2005, the School of Architecture at The University of Texas at Austin used Second Life in the course Designing Digital Communities, and Southern New Hampshire University used it for their course Introduction to International Business (Graetz, 2006).

Rebecca Nesson, a Harvard law school graduate who is teaching a course called "CyberOne: Law in the Court of Public Opinion," along with her father law school professor Charles Nesson explained, "The typical experience in a distance-education class is to go to a website, watch a video, [and] correspond by e-mail ... usually just with the instructor and even then only intermittently,". "Second Life gives us the capability to really have a classroom experience with the students." (Lamb, 2006, para.6).

3. Immediacy: interaction takes place in real time.

One of the attractions of virtual worlds is that they can be used to broadcast events like concerts or interviews. Bruno (2006) reported that singer Suzanne Vega became the first major recording artist to perform live in avatar form in Second Life as part of a simulcast on the public radio station Infinite Mind. Recently, in January of 2007, the inaugural events at the start of the 110th Congressional session were delivered virtually in Second Life Virtual Capitol Hill (Reuters, 2007).

It is this aspect of immediacy that can also be used to foster collaboration in educational settings. Within the Active Worlds Educational Universe there are a variety of activities from demonstrations of art and scientific concepts to meetings between physically remote students (Sourin, Sourina, & Prasolova-Førland, 2006).

Virtual learning need not be limited to topics that are found in the real world. Ms. Robbins, who teaches English 104, sent her students dressed like pitchers of Kool-Aid out into the community to interact, observe and record the reactions of other residents. As such, her students became researchers of virtual environments and her class became a vehicle for social and philosophical exploration (Lagorio, 2007).

Even businesses have recognized the learning potential of virtual worlds. In November of 2006, IBM announced a set of training efforts that employed video game technology and three-dimensional Internet environments in virtual environments including Second Life. Ted Hoff, IBM vice president of learning, said video game play adds a dimension to training because people don't perceive it as learning. That makes them more willing to take risks and be more flexible in their thinking (Frauenheim, 2006).

4. Interactivity: the world allows users to alter, develop, build, or submit customized content.

One of the most widely used functions in virtual worlds is building. Building activities can include the relatively traditional construction of virtual houses, offices and other architectural wonders in virtual environments to the creation of software programs and content which can be used to augment or modify the virtual world experience itself.

Two of the three largest virtual communities, 'There' and Second Life, have virtual economies that use a persistent currency throughout their virtual worlds. There's economy uses ThereBucks and Second Life uses Linden Dollars (Digital branding: Virtual becomes reality, 2007).

The creators of 'There' believe that technology, business, and culture have finally caught up with user expectations. In 'There' just like in real life, people use things to show their own personalities, styles and attitudes. This results in members spending real money to upgrade their avatar's clothing and belongings (Kushner, 2004).

Reiss (2005) interviewed Philip Rosedale, Linden Lab's founder, about Second Life which is virtual community based on a capitalistic market economy. Rosedale said that in September of 2005, residents spent $906,361,808 virtual Linden dollars for things like specialized programmed objects and scripts which were created and programmed by resident entrepreneurs. Linden dollars can be converted into US dollars at online market prices. In September, the exchange rate was 252 Linden dollars to one U. S. dollar, so residents in September spent U.S. $3,596,674 for things like specialized clothing for their avatars or prefab housing.

A recent article in The Economist (Living a Second Life - Virtual online worlds, 2006) stated that Second Life already had about 7,000 profitable "businesses", where avatars supplemented or made their living from their in-world creativity. The top ten in-world

entrepreneurs were making average profits of just over $200,000 a year. The virtual economy thrives because residents own the intellectual property inherent in their creations. Linden Lab does not sell advertising; instead it is a virtual property company.

In May of 2006, the cover story of Business Week magazine featured an avatar named Anshe Chung who has since become Second Life's first millionaire in real U.S. dollars (My virtual life, 2006). Anshe's creator, Ailin Graef achieved her fortune by beginning with small scale purchases of virtual real estate which she then subdivided and developed with landscaping and themed architectural buildings for rental and resale.

Layton (2007) said that most of the big money earners are real-estate agents or land developers, but avatars have jobs as diverse as any in the real world including, bouncers, bar tenders, prostitutes, and advertising executives. Originally, virtual businesses were created which catered to the needs of the virtual community. For example, individual designers sold software clothing and accessories to allow avatars to be as trendy and fashionable as their real world counterparts or "MetaAdverse", a network of advertising billboards inside Second Life, allowed property developers a platform to display images of their creations (Living a second life - Virtual online worlds, 2006).

While some have argued that these economies are over-hyped at best or just pyramid money making scams, there is no denying that they have attracted the attention of big business. Recently, real world corporations and advertisers such as, Adidas, American Apparel, BBC, Dell computer, Sun Microsystems, Wells Fargo, Reuters, Nike, Sony-BMG and Toyota have joined Second Life in an attempt to connect virtual world inhabitants with real world goods and services (Layton, 2007; Bruno, 2006).

Most of these companies did not perform their own building activities within Second Life, but instead turned to technology companies that specialized in developing a real-life company's virtual presence in Second Life. Electric Sheep Company built Second Life presences for Nissan, Starwood and Ben Folds, and they even recruited their employees from inside Second Life.

Furthermore, Layton said that it seems that many businesses are positioning themselves for a future marketing advantage: the selling of real objects in a virtual setting. Some day in the not to distant future your avatar could fly to a virtual mall, walk into a virtual Nike store, buy a pair of sneakers priced in Linden dollars, and then you would wait for the actual, real-life sneakers to arrive via delivery service on your real-life doorstep.

5. Persistence: the world's existence continues regardless of whether individual users are logged in.

While individual participants may enter or leave a virtual world, there are many things that remain even after a user's computer is turned off. Besides the virtual objects, landscapes, avatars and buildings that, to a certain extent, can be considered to exist, there are virtual data bases and learning environments that continually remain prepared for interaction with avatar visitors.

In addition to the existence of virtual courses, many schools and organizations have set up virtual libraries in Second Life. The Alliance Library System in East Peoria, Illinois, and the Public Library of Charlotte and Mecklenburg County (PLCMC) in North Carolina have recently announced a new collaboration to build a cultural and informational service with and for teens as part of Teen second Life and Eastern University in Pennsylvania has created an academic library virtual world (Neiburger & Gullett, 2007; Abram, 2006).

Jean Gardner, the librarian for the Topeka and Shawnee County Public Library (TSCPL) in Kansas, reported that the library recently closed a deal with Linden paying $900 upfront, with an

additional $150 monthly maintenance fee, for an island which they've christened "Oz." TSCPL is partnering with Hope Street Academy, a local charter school, which will provide a pilot group of 15 to 30 high school students to participate in the TSL project. They hope the project will inspire at-risk students (Czarnecki & Gullett, 2007). Abram (2006) said that some students are motivated to research Greek, Roman and Norse myths to learn more about the avatars featured in video games. This is an example of virtual world environments stimulating interest in real world affairs.

Other virtual institutions exist solely for the purposes of enjoyment or sensory appreciation. Second Life's Starfish Art Gallery held a recent art show containing a selection of artwork that included both the works of Claude Monet and images of popular cartoon characters like Donald Duck and Bugs Bunny (Book, 2004). This display challenged traditional values of high and low art by contextually framing pop culture images as fine art and giving them equal visual placement within the gallery space.

Other environments persist to give visitors experiences that are not obtainable in the real world. Peter Yellowlees, a professor of psychiatry at the University of California, Davis, created virtual hallucinations to allow residents an opportunity to experience schizophrenia because he was never really able to explain to his students just how their patients suffer. "It's so powerful that some get quite upset," says Mr. Yellowlees (Living a second life - Virtual online worlds, 2006).

Besides providing information databases and exhibitions to enrich the knowledge and experience of virtual world inhabitants, many residents occupy virtual space just to be able to hang around with other people who share similar interests.

6. Socialization/Community: virtual worlds allow and encourage the formation of social groups like guilds, clubs, cliques, housemates, neighborhoods, etc.

Residents use Second Life for a variety of purposes. Given that you can do anything or be anyone in Second Life the activities that can be done and possible purposes for doing them are nearly infinite. They rehearse responses to earthquakes and terrorist attacks. They form support groups for cancer survivors or build Buddhist retreats and meditate (Living a second life - Virtual online worlds, 2006).

In 'There' during the summer of 2004, a born-again Christian member constructed an elaborate pavilion in order to evangelize to other members of the community. The pavilion came complete with glowing crosses and billboards saying "Jesus is Lord". This religious example stands in contrast to the annual virtual gay and lesbian parade, featuring "dykes on hoverbikes" that was repeated in June of 2005. Book (2004) mentioned that 'There' has always bad a fairly visible gay, lesbian, bisexual and transgender (GLBT) population, in part, because for some individuals who live in less tolerant areas, virtual worlds may be the only safe places for them to be able to express their identities comfortably.

On an island in SL, Unicef and Global Kids hosted a cyber-festival relating to HIV/AIDS, education, health and child exploitation and abuse. Some fifty teenagers joined over a dozen teams to compete in an online building challenge. Their designs included an HIV/AIDS hospital, various school environments, and a safe play area (Carter, 2007).

Groups that originally meet for one purpose may voluntarily return for a totally different one. Rebecca Nesson, instructor at Harvard Extension School, felt that Second life can bridge the gap between teachers and students in a distance-learning environment by allowing them to spend time together socializing outside of class (Lagorio, 2007).

Though ethnographic research, Jakobsson (2006) found that the social interactions in virtual worlds were as real as the physical world. People showed real emotions and their interactions with one another had real consequences. He also mentioned the "building" aspects in Active Worlds and described the cities that were built as having an urban-sprawl feeling to them, similar to the real world city Los Angeles. In addition he said that the worlds were lacking in fantasy because residents could only build items from a pre-existing library of objects. This lessened the construction activity to one of assembly rather than creation.

Carter (2005) also performed ethnographic studies on the participants in virtual worlds. In Cybercity, she found that participants used virtual worlds to strengthen their webs of relationships, not weakening them. She also discovered that relationships in cyberspace echo those in real life, are maintained by time and effort, and are routinely moved offline. Cyberspace is just one more place to meet friends.

After taking a look a the various types of current technologies used to make student learning more collaborative and motivating, it is time to discuss some of these features in relation to their educational effectiveness.

Comparison of Collaborative Technological Tools

It is not my intent to equate effective teaching learning with technological use. Effectiveness in learning depends on many factors unrelated to which, if any, technological tool is used. From my own teaching experience, course content, specific student population, teacher attitudes and abilities, and technological tools are all important aspects to be considered, observed and adjusted. Hanson (2005) stated that technology in itself does not change or improve teaching and learning, and stressed that focus be put on management processes, strategy, structure, roles and skills.

However, I am also not saying that all technological tools are equal, or that one tool can be easily exchanged for another. Taking a constructivist point of view, we can see which tool is likely to be the most effective in a classroom situation. Jonassen (1999) has researched and theorized regarding constructivist learning environments.

Jonassen (n.d.) listed the characteristics of meaningful learning in designing constructivist learning environments:

1. *Active*. He believed that students should not just learn about something, they need to do it.

2. *Constructive*. He said that students need to be able to construct their own meanings and that these meanings and constructions will develop and improve over time.

3. *Collaborative*. Sharing information with others and working out problems together is a more efficient, natural and productive method than insisting that students work things out by themselves.

4. *Intentional*. When learners intentionally and actively try to accomplish a specific goal, they think and learn more.

5. *Complex*. In simplifying problems for students to solve we do a disservice to them because we show them that the world is reliable and easily understood place, which is not true.

6. *Contextual*. Students need to do more than memorize abstract rules; they need to work on real world problems that have significance for them.

7. *Conversational*. When students talk to others they can receive alternative viewpoints and learn that there are multiple methods of solving problems.

8. *Reflective*. When students are able to explain the processes they go through to solve a

    problem and the answers they found, it helps them to understand that process better,

    and will allow them to apply it in new situations.

While many of these characteristics are mainly teacher or student dependant, some of them

can be seen as providing attributes that can be used to distinguish between educational

technological tools. Since the characteristics of Intentional, Contextual and Reflective are those

that teachers or students use to direct learning, or better understand and organize what has been

learned, they are more related to personal characteristics than to tool characteristics. This leaves

the characteristics of Active, Constructive, Collaborative, Complex, and Conversational to

compare the various educational technological tools that have been previously introduced. Each

of these tools is evaluated on whether they provide the learner with a low, medium or high

degree of potential usage of a particular characteristic (See Table 1).

Table 1

Constructivist Learning Aspects of Current Educational Tools

Tool	Active	Constructive	Collaborative	Complex	Conversational
Blog/Message Board	low	low	medium	low	medium
Wiki	low	medium	high	low	medium
Chat	low	low	medium	low	high
Simulations	high	medium	low	high	low
3D Games	high	medium	medium	high	medium
Videoconferencing	medium	medium	medium	medium	high
Virtual Worlds	high	high	high	high	high

Note: Based on Jonassen's characteristics of learning in constructivist learning environments

Of course these evaluations are still task dependent; if all educational learning tasks just

involved text, words and ideas, then these evaluations would be totally different. Message boards

and chat are as active and constructive as virtual worlds when only dealing with text. However,

because in virtual worlds participants can move around in a 3D space and create and interact with objects they can deal with a much higher degree of construction and activity.

Simulations and 3D games are immersive and engaging, but they don't necessarily allow collaborative and conversational activities. In virtual worlds, being a part of the social activity is a key component in participation. While video conferencing can be a conversational and active activity, it is often used just as a passive vehicle to deliver a live lecture from a distant location.

Many of these differences can be seen from the point of view of how many different senses are commonly used in each of the various tools. It is hard for the other tools to match the complexity of experience that virtual worlds can potentially deliver. When used effectively, sound, images, movement and collaborative interaction are all part of the total experience that virtual worlds can provide.

McCahill and Lombardi (2004) said that current content management and learning management systems (CMS, LMS) don't take full advantage of the powerful graphic and simulation capabilities of modern personal computers. In order to support constructivist approaches to education, a far more collaborative and interactive environment than is offered by the web-page based tools of current CMSs and LMSs is needed. Constructivist learning is better served by using an immersive 3D virtual multi-user platform.

Zhao (2000) said that 3D worlds created from VRML provide a virtual reality that is closer to natural human experience than those provided by 2D web pages. VRML worlds provide individual viewers with a variety of experiences, and that the viewers are in the control of how they want to interact with the information in the worlds.

While it is clear that virtual worlds can provide more opportunities for realistic and engaging learning, is there a theoretical rationale that can explain the benefits of using virtual worlds in an educational setting?

2.5 Theoretical Concepts and Issues

While many of the following comments can be seen as relating to many newer technologies, I feel they are especially relevant for the immersive, creative, and authentic environments that virtual worlds can provide. This discussion, hopefully, will provide a rationale for using virtual worlds as a vehicle for increasing students' motivation and abilities towards learning in general, and in developing English language skills in particular. The main theoretical perspective discussed is Constructivism. Multiple Intelligences theories are also included to provide some insight and a complementary viewpoint in which to understand the workings of Constructivism. Finally, Motivation and its relationship to Second Language (L2) learning is discussed to demonstrate basic links between Constructivist theory and actual language learning.

Constructivism

There is an old Chinese proverb. "Tell me, I forget. -- Show me, I remember. -- Involve me, I understand" (Driscoll, 2002). This proverb, in some ways, summarizes the principles of constructivism, a learner-centered view of learning which says that learners develop their own understanding of the way the world works rather than having it delivered to them in an already organized form (Eggen & Kauchak, 1996).

Vygotsky (1978), Russian psychologist and one of the major proponents of social constructivism, believed that cognitive skills and patterns of thinking are not primarily determined by innate factors, but are the products of the activities practiced in the social institutions of the culture in which the individual grows up.

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One essential tenet in Vygotsky's theory is the existence of what he called the "zone of proximal development" (ZPD). ZPD is the difference between a child's capacity to solve problems on his own, and his capacity to solve them with assistance. This assistance can come from many directions, such as "scaffolding" where a teacher supports or guides the student with just enough information to help the student become independent. This assistance can also come from other students in the form of peer collaboration (Vygotsky, 1976, 1978).

Jonassen, Carr, and Yueh, (1998) pointed out the benefits of using "Mindtools" in providing constructivist learning environments. Mindtools are computer applications that engage learners in critical thinking about the content they are studying. Mindtools scaffold different forms of reasoning about content and require students to think about what they know in different, meaningful ways. Jonassen et al. did not specifically mention virtual worlds, but they mentioned similar software environments such as microworlds and collaborative tools.

Microworlds are exploratory learning environments where learners can navigate, manipulate or create objects, and test their effects on one another. They mentioned video-based adventure games as an example of a microworld that requires players to master each environment before moving on to more complex environments. They mentioned the compelling and immersive nature of these worlds which excel in maintaining participant's attention. They said this occurs because users can exercise so much control over the environment.

Conversational tools such as chat, videoconferencing and message boards can be used for collecting information, supporting interpersonal exchanges, and solving problems collaboratively in groups of students. Jonassen et al. believed these mindtools are effective because they help students reflect and organize what they know in a meaningful manner. In effect, students become teachers because they have to teach the computer.

Jung (2002) felt that the elements of scaffolding information and promoting collaboration are present in virtual worlds, and can aid in the acquisition of a second language. She went on to suggest that virtual worlds provide a vehicle to realize social interactions between individuals. Gee (2003) went further and argued that all knowledge communities function as semiotic domains that give meaning to the social and physical practices that occur within them. When learners initially enter into virtual worlds as newcomers, they are unfamiliar with these domain-specific meanings. However, through active participation and interaction with others who understand community practices and concerns, they learn to experience and understand the world in new ways. In this manner, the new participant develops problem solving strategies, which may be transferable to other circumstances.

Therefore, it can be seen that virtual worlds are able to provide a supportive, social and collaborative framework in which the construction of knowledge can take place.

Another important notion of the construction of knowledge is that it occurs in an authentic environment. Constructivism stresses the importance of the learner and the use of realistic examples and experiences. Eggen and Kauchak (1996) mentioned that successful constructivist learning depended on the use of realistic examples. They felt when teachers used more realistic examples, student learning was more effective; the more realistic the better. Nomnian (2002) mentioned that the constructivist approach emphasizes environments, skills, content, and tasks which are authentic and realistic.

Jung (2002) described virtual worlds as being entertaining and more realistic than just pictures in an English textbook. Interaction with others using avatars is one way that virtual worlds provide an authentic and realistic experience. One rationale for how avatars provide realism draws on their ability to provide users with both a heightened sense of personal presence

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and co-presence. Personal presence is the feeling of "being there", while co-presence is the feeling that others exist with you and feeling part of a group or process (Casanueva & Blake, 2000).

These studies suggested that presence and co-presence are important influences in online interaction, as they enhance the social, communication and educational experience provided by collaborative virtual environments. In fact, Casanueva and Blake reported that collaboration has the effect of enhancing presence and co-presence experiences. Participants who collaborate feel more a part of the virtual world.

Another of Vygotsky's contributions is the notion that mediational means intersect with the individual and social planes (Vygotsky, 1978). Mediational means are tools such as verbal language and visual arts which allow us to shift our abilities from a reliance on elementary functions to higher psychological functions, from a direct to an indirect or mediated relationship to the environment. When students use different types of mediational means to represent ideas and concepts, it helps them to reflect and develop new perspectives. Virtual worlds can provide students with many modalities of interaction and expression using visual, auditory and special mechanisms.

Virtual worlds are particularly suited to the promotion of constructivist learning because they provide realistic and authentic environments, support collaboration and encourage innovative thinking.

Multiple Intelligences in Constructivism

Another theoretical perspective which is complementary to constructivism is that of "Multiple Intelligences", and can be used to provide some insight into how constructivist principles achieve academic goals. In the same way that Howard Gardner and Robert Sternberg

expanded the definition of intelligence, concepts related to multiple intelligences and creativity can expand our understanding of effective learning.

Gardner's Multiple Intelligences (MI) theory stated that all human beings possess at least eight forms of intelligence: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, naturalist, interpersonal, and interpersonal (Gardner, 2000). Gardner (1995) stated that one of the reasons that MI theory has attracted a lot of attention in the educational community is because of its affirmation that, "we are not all the same; we do not all have the same kinds of minds; education works most effectively for most individuals if these differences in mentation and strengths are taken into account rather than denied or ignored" (p. 208).

In response to these differences, Dara-Abrams **(**2005) stated that in order to learn and succeed in an educational setting, adult learners must be able to share these differences with others, be given responsibility for their own learning, and have concepts presented to them via multiple methods. Virtual environments use avatars and spatial worlds to provide a community in which individuals can express themselves using images, sound and movement. Hansson (2005) said that Active Worlds, if properly used, can be truly interactive and can accommodate students at different proficiency levels.

Sternberg (2003), in his theory of successful intelligence, stated that people are successfully intelligent to the extent that they have the abilities needed to succeed in life. The three abilities, and categories, of successful intelligence are: analytical, creative, and practical. These three categories from the theory of successful intelligence can be used to examine some aspects of successful learning in a conversation class setting.

One of the most practical aspects of using virtual worlds is in being able to communicate and collaborate with others. Virtual worlds hold potential benefits for language learning due to

their ability to provide collaborative and immersive constructivist learning environments.

Scarcella and Crookall (1990) explained that second language learners acquire language when: (1) they are exposed to large amounts of comprehensible input, (2) they are actively involved, and (3) they have environments which promote positive attitudes, desires, and feelings (cited in Jung, 2002).

Scardamalia (2002) said when students become active participants in the knowledge construction process, the focus of learning shifts from covering the curriculum to working with ideas. This collaboration not only motivates students to become involved with the class material, it also aids in their understanding as well. Cromby, Standen and Brown, (1995) said that virtual environments can help language learning and stimulate students toward new ways of thinking and structuring information.

Collaboration, as reported by Grant (2006), is a social activity and can be looked at from the perspective of knowledge-building networks (Scardamalia 2002). Knowledge building networks take a constructivist view of learning and see learning as the result of acting on and in the world.

Related to the analytic aspect of intelligence, are Jensen's (1998) views on the brain enrichment benefits of problem solving. Jensen said that neural growth occurs as a result of the problem solving process. It's the questioning process that is important, not coming up with the right the answer. When students collaboratively question and discuss ideas they are creating an atmosphere for brain growth.

Guynup (2003), in research that attempted to summarize 3D environments from 1995 to 2003, found that a great majority of virtual sites on the Internet were virtual galleries and

museums. It seems one of the effective uses of virtual worlds is in the authentic presentation of visual, aural and positional information.

Just as the goal of going to a museum isn't to create subject mastery but to increase interest and broaden perspectives, the participation in virtual worlds is not the ultimate goal of student involvement. Instead, the aim is the production of deeper understanding, reflection, and communication abilities in those students.

Jonassen et al. (1998) didn't feel that using computers made learning easier and effortless. On the contrary, they reported that the benefit of using mindtools was in learners having to think harder and more meaningfully than they would have to do without the tool. Students generate new ideas and develop new organizational methods as they construct their own realities.

Creative qualities are those aspects which are most directly related to those of Constructivism. Because Constructivism places the learner at the center of the learning process, students progressively create their own knowledge base, rather than being taught the answers by a teacher (Eggen & Kauchak, 1996). The collaborative environment and plurality of ideas from various group members nurtures creativity. Lombardi and McCahill (2004) pointed out that collaborative learning is what virtual environments (VE) do well, where participants construct knowledge in group conversation and within the context of an older and existing community of practice.

McGraw (2004) said that creativity is not logical, and is certainly not a process that comes about in an ordered, sequential, step-by-step fashion. He went on to relate the opinions of Dave Rice, assistant professor of biomedical engineering at Tulane University. "Most students coming into these classes are afraid of making mistakes. Their entire educational experience is to come up with the right answer. For creativity to take hold, you need to have them invest in a chance to

experiment. Try a few things and break a few things"(p.33). McGraw said that projects which encourage open-ended problem solving, and the having the willingness to fail are the keys to creative behavior.

Creativity is also related to concepts such as involvement and motivation. These concepts were described by Csikszentmihalyi (1996) in his research on "Flow". Flow is an optimal state of intrinsic motivation, where a person is fully immersed in what he or she is doing. He said flow is, "Being completely involved in an activity for its own sake. The ego falls away. Time flies. Every action, movement, and thought follows inevitably from the previous one, like playing jazz. Your whole being is involved, and you're using your skills to the utmost" (Geirland, 1996, p.160).

Csikszentmihalyi commented on creating more interesting and interactive web sites, "The variety of sensory inputs allows you to create a visual image that has all kinds of dimensions bubbling up inside it. We are still a multimedia organism. If we want to push the envelope of complexity further, we have to use all of our devices for accessing information - not all of which are rational" (Geirland, 1996, p.160). Csikszentmihalyi's viewpoints can be looked at as providing direction towards producing motivating and effective virtual environments.

The point where creativity meets motivation has also been explored by Theresa Amabile in her studies of intrinsic motivation. She proposed that intrinsic motivation is generally conducive towards creativity whereas extrinsic motivation typically hinders creativity. Intrinsic motivation is defined as the motivation to engage in an activity primarily for its own sake because the individual finds the activity itself to be interesting, satisfying, challenging or involving. In contrast, external motivational is defined as motivation to engage in an activity to meet some goal which is external to the activity itself, such as winning a contest or fulfilling some requirement (Collins & Amabile, 1999).

Deci and Ryan (1985) pointed out many positive benefits of internal motivation and learning. They reported studies which showed that internal motivation is positively correlated with learning achievement scores and that any condition which lessens internal motivation impairs performance on conceptual activities. They pointed out that classroom environments that promote cooperation, autonomy, and self-determination enhance internal motivation and facilitate learning. The aspects they discussed are the same as some of the core attributes found in constructivist learning.

Dickey (2006) suggested that massively multiplayer online role-playing game (MMORPG) design may provide a flexible model for educators to create learning environments which foster intrinsic motivation by providing choice, collaboration, control, challenge, and achievement. Participating in creative activities is a fundamental aspect of participating in virtual environments. From creating avatars, and objects to designing dwellings or even the world itself, virtual words seem uniquely suited towards creative possibilities by allowing participants to express themselves creatively and participate in creative activities.

Motivation has been recognized as an important factor in the construction of knowledge and should be considered an integral component of constructivist teaching. Palmer (2005) provided a summary of motivation strategies that teachers should use to enhance student motivation. These strategies included:

1. Challenge students by setting tasks at a moderate level of difficulty.

2. Use novel or discrepant experiences to arouse curiosity.

3. Use fantasy.

4. Increase the meaningfulness of content and tasks by relating them to the students' lives.

5. Use a variety of different types of activities and tasks.

6. Allow students to be active participants in the lesson.

7. Allow students to work individually or collaboratively in situations that do not encourage competition.

Providing appropriate tasks in a virtual world can easily be seen as providing students with activities that can stimulate curiosity, incorporate fantasy through creativity, allow students to direct their creative energy in a direction of their choosing and under their control. Engaging in these types of challenging activities increases motivation and promotes collaboration on student-directed projects (Palmer, 2005). These strategies are similar to recommendations made by Doolittle (1999) in his research on constructivist learning related to online environments. Doolittle's recommendations also included the need for learning to take place in authentic and real-world environments and that students' assessment should inform future learning experiences.

As can be seen from the previous discussion, the areas of motivation, creativity, collaboration, and authenticity are all related to and mutually dependent upon one another. By allowing students to collaborate in virtual worlds, they should benefit from engaging in activities that are motivating and creative. By encouraging them to make avatars and build environments, they become involved with activities that can help them communicate in ways that are authentically challenging, and both literally and theoretically constructive.

Pedagogical aspects of group discussion and conversation go beyond finding the right answers to a test or fulfilling class requirements. They point towards finding creative ways to promote useful acquisition of the language itself. Using class materials that are authentic and interesting to students, and allowing them to discuss them in ways that also occur outside the

classroom reinforces the practicality of the experience. Virtual worlds provide many of the aspects of constructivist learning that are both creative and motivational.

Motivation in second language learning

Social issues are not just related to constructivist learning, but are also important for students studying a second language (L2). Dornyei (2003) stated that the first comprehensive study of motivation in second language acquisition (SLA) began in Canada by Robert Gardner and Wallace Lambert. Gardner and Lambert (1972) found that an individual's orientation to learning French as an L2 was related to three factors: (1) motivation to learn French, (2) attitudes toward French Canadians, and (3) proficiency in French. In this early study, they made a distinction between instrumental motivation and integrative motivation.

According to Gardner and Lambert, instrumental motivation refers to the L2 students desire to learn the target language for practical purposes like getting good grades in school or obtaining a good job. Integrative motivation is related to the L2 students desire to identify with the L2 culture and wanting to be like its members. In early studies, Gardner and Lambert found integrative motivation to be better than instrumental motivation in promoting SLA. Instrumental motivation can be seen as being more related to extrinsic motivation, whereas integrative motivation is closer to the concept of intrinsic motivation which was discussed previously.

Dornyei (1990) stated that in certain situations instrumental motivation can be as important a factor in determining success in SLA as integrative motivation. He said that this is especially the case in EFL environments where learners have little opportunity to interact with native speakers of English. Such is the case in Taiwan where learning English is more the result of learning the target language in an academic setting than the result of interacting with the target language community.

Ho (1998) studied the motivation of 480 English learners from nine Taiwanese junior high schools. She found that Taiwanese students were much more instrumentally oriented than integratively oriented. Students were more interested in learning English for instrumental reasons such as getting into a better high school, getting a good job, and going traveling.

However, even in situations where there is no direct interaction with L2 speakers, Dornyei (2003) said that the integrative dimension might actually involve a broader concept. He suggested that it might be related to an individual's self-concept and indicated what a person aspired to become. He said that is possibly why one still finds a significant integrative motivational component in students in Mainland China who have never traveled to an English speaking country nor met a native speaker of English.

The Attitude/Motivation Test Battery (AMTB) was developed to measure variables associated with L2 learning (Gardner, 1985). These variables can be grouped into five categories:

1. *Integrativeness*- refers to the individual's willingness and interest in having social interaction with members of the L2 group.

2. *Attitudes toward the Learning Situation*- reflects the student's evaluation of formal instruction.

3. *Motivation*- refers to the individual's attitudes, desires, and effort to learn the L2

4. *Language Anxiety*- reflects the individual's apprehension in the language class or in settings where the language is used.

5. *Other Attributes*- refers to other variables that have been included in some studies.

Gardner said that numerous studies have demonstrated associations between scores on these measures and achievement in the L2. He went on to say that the results indicate that the three components of Motivation tended to be correlated with each other and correlated more

highly with SLA achievement than did the measures of Integrativeness and Attitudes Toward the Learning Situation (cited in Gardner, Tremblay, & Masgoret, 1997).

In 2003, Masgoret and Gardner conducted a meta-analysis of studies exploring the relationships among attitudes, motivation, and SLA. The meta-analysis was intended to investigate the validity of the socio-educational model in both EFL and ESL contexts. The data set included 75 independent samples involving 10,489 individuals and conducted in either ESL or EFL contexts, and obtained from elementary, secondary, or university students. The meta-analysis reported that attitudes and motivation were related to L2 achievement, and that motivation was more highly correlated with L2 achievement than with attitudes.

The results from these studies suggest that motivation plays a primary role in L2 learning. In the above mentioned research by Gardner, Motivation is measured by three scales: (1) Attitudes toward Learning the Language, (2) Desire to Learn the Language, and (3) Motivational Intensity. Gardner also said that motivation, as seen from the framework of the socio-educational model, is somewhat malleable. Motivation is affected by other factors such as learning attitudes and the learning situation. While many researchers assume the stability of the attitudinal and motivational variables in instruments such as the AMTB, Gardner said there had been little research regarding this issue. In fact, the purpose of a study by Gardner, Masgoret, Tennant and Mihic was to find out how stable the variables of the AMTB were, and to determine which ones were the most and least stable (cited in Gardner, 2001).

In that study, students were tested twice, once in September and again in the March. The study found that some variables such as Integrative Orientation and Interest in Foreign Languages were relatively stable. Even the variable of Language Use Anxiety was relatively resistant to change. However the variables of Motivation, and Attitudes toward the Learning

Situation were found to be relatively flexible. Gardner believed this indicated the possibility of being able to make changes in the learning environment which, in turn, could produce changes in motivation and in language achievement (Gardner, 2001; Masgoret and Gardner, 2003).

In an earlier study, Gardner, Smythe and Brunet (1997) even found changes in attitudes, motivation and proficiency during a six-week summer course. They reported that the course was particularly effective in increasing student motivation.

Some investigators have felt that there are other variables involved in motivation and language learning that go beyond the socio-educational model framework developed by Gardner (Dornyei 2003, Yashima 2002, Warshauer 1996). Even Gardner, Masgoret, Tennant and Mihic (2004) pointed out the complicated relationship aspects regarding motivation and second language learning. They stated that attitudes, anxiety, achievement and motivation in second language learning all interactively influence one another.

Warschauer (1996) investigated the motivating nature of computers toward second language learning. He examined specific aspects of computer-assisted language learning and student motivation in actual classes in an attempt to broaden motivational frameworks to make them more pragmatic and pedagogical. Warshauer was interested in finding out which aspects second and foreign language students found motivating by researching 12 different writing and communication classes from Taiwan, Hong Kong and the U.S. He found three major motivating factors: communication, empowerment and learning. By using computers, students felt that they could benefit from communicating with each other, enhancing their own personal power, and learning more creatively, and effectively.

Under the context of the current study, computer attitudes and their motivating influences in second language learning are important and necessary factors to consider in addition to the three important motivational scales from the socio-educational framework.

2.6 Studies of Virtual Worlds and Education

While the vast majority of current literature regarding virtual worlds has been written regarding the potential economic or social issues that these worlds provide, there have been several studies based on the educational aspects that virtual worlds can foster.

Designer-instructors, Patrik Svensson and Pat Shrimpton, created the "Wedding Project" which was expected to achieve a joining of the sub-disciplines in their English program with traditional and new electronic media. They used "Wedding" as a metaphorical theme to go beyond drills and information retrieval commonly used in learning and studying English. Students used a variety of communication strategies such as face-to-face, hard-copy, e-mail, web-site development, and virtual reality, to collaboratively bring in knowledge from various academic fields, develop critical thinking skills and use active learning principles toward communicating their ideas in English (Riner, n.d.).

Using the Active Worlds virtual environment was only a part of this project and was one of the elements of the project that students recommended be changed in the future. One of the students stated "I think we should have had more time in world. In the beginning it was all work on text. I think we should have visited there first, then begun work on the texts. Balance it more." Another said, "We started working in-world only a few weeks before Presentation; ... to have had a more in-depth presentation of the World, how it works, how to get things done in it, etc. ... we could have been more effective in how we used the world for our Presentation" (p. 16). These

statements indicate that students were very interested in the virtual world part of the program and seemed to be willing to spend more time learning about how to use it better.

A similar pilot study by Hansson in 2005, involved ESL students in Denmark and combined face-to-face discussion with activities in the Active Worlds environment. Students in Active Worlds were encouraged to build, play, and chat with each other. Students then took these experiences to create a written narrative that was placed on individual and collective blogs. Hansson suggested that teachers recognize the importance of "playfulness" and incorporate elements of videogame design and student controlled learning into their educational activities.

Dickey (2005) studied the use of Active Worlds in distance learning. She found these worlds could provide students with opportunities for cooperative and collaborative learning in both formal and informal educational settings. In addition, the immersive environment allowed users multiple methods of interaction and representation.

In an earlier study, Dickey (2003) found that the text-based discourse tools used in Active Worlds (AW) supported the findings of Riner's (1996) research of text-based virtual worlds. Learners often helped each other with explanations and clarifications and demonstrated activities such as collaboration, social negotiation and peer mentoring.

She said that while the AW interface does provide learners the ability to interact with objects and other learners in the 3D environment, it could possibly be improved on by adding whiteboard or collective writing spaces. However, she cautions that adding too many web interfaces might possibly detract from the 3D experience.

In a learning group similar to that of the present study, Peterson (2005) investigated the interaction strategies of non-native speakers of English (NNS) and explored the possibility of using avatar-based virtual worlds as computer assisted language learning (CALL). He found that

NNS's employed both interactional (greetings, positive and negative politeness behaviors) and transactional (waving, abbreviations, turn taking, clarification requests) strategies when interacting in Active Worlds. He determined that virtual worlds were worth further investigation. However, a significant limitation in his study was the amount of time that the students spent communicating in Active Worlds environment. They spent only ninety minutes of time interacting with each other.

In a later study, Peterson (2006) expanded the time NNSs spent communicating with each other in three one-hour sessions. Analysis of chat logs of the participants confirmed the findings of his first study regarding the types of interactions students employed. In addition to using both interactional and transactional strategies, students engaged in negotiation of meaning during their interactions in a similar fashion to that of face-to-face interaction. Students used confirmation and comprehension checks to negotiate meaning.

His study also confirmed that the use of avatars in a virtual environment provided the participants with feelings of telepresence and copresence, similar to the findings by Casanueva and Blake (2000). In other words, avatars helped the students feel as if they were actually there in the world communicating with their classmates.

There has been some research related to student-created objects. Winn (1997, 1999) had students use 3D Computer Aided Design (CAD) software to design 3D objects which were then programmed by laboratory staff into virtual environments (VEs). Students then visited these VEs, but only for a short time of about fifteen minutes. Afterwards, through questionnaire and posttests for general and spatial ability, they determined that students enjoyed building and visiting their VE. In addition, their enjoyment, ability to work in the VE, success, and their sense of presence were all found to be interrelated.

Barab, Thomas, Dodge, Carteaux, and Tuzun (2005) researched the Quest Atlantis (QA) project, a learning and teaching project, that used a multi-user, virtual environment to immerse children in educational tasks. Their goal was to develop a technology-rich game without guns that teaches and informs. The QA environment combines commercial gaming strategies with education research on learning and motivation.

In QA, students interact with the Atlantian Council, and help them to avoid disaster of their world by learning about the Earth. Although children know the Council is not real, they find the story line engaging and motivating, and helping the Council rebuild the lost knowledge of Atlantis serves to establish an altruistic context for participation. The purposes of QA are to allow the students to think about and participate in issues involved in social involvement, environmental awareness and compassion.

QA is an example of design-based research which involves bringing research into real-life settings as opposed to performing studies in constrained laboratory contexts (Brown, 1992).

Gynup and Demmers (2005) discussed elements involving students playing "Go Fish", a 3D environment game that teaches children about coral reefs. They recommended that the learning aspect of the game ought to be as autotelic as possible; learning should support success in the game.

In the Narrative Immersive Constructionist/Collaborative Environments (NICE) project, the task for students was to take construct and care for a virtual garden. Roussos et al. (1999) found that "the presence of avatars representing remote users was a strong spur to social interaction, again at the expense of the intended science learning" (p. 260). In other words, the conversational aspects of the virtual world outweighed the educational task learning. However,

this finding adds evidence toward the potential success of the proposed study since its main educational goal is to promote and motivate conversation.

Delwiche (2006) taught and researched two different courses using the virtual environments which are sometimes referred to as massively multiplayer online games (MMOGs). In the first course, the purpose was to teach research methods to 36 students in an undergraduate communication course. Students took an ethnographical research approach to the on-line game Everquest. As students participated as players in the game, they explored the behaviors, cultural practices, symbolic expressions and motivations of other Everquest players. In the second course, he used the virtual community Second Life to teach students the fundamentals of videogame design and criticism. From the lessons learned through both of these studies, he suggested that game-based learning is most effective when students can apply what they learn in the game world to an overlapping domain of professional practice.

Dede, Clarke, Ketelhut, Nelson, and Bowman (2005) designed and studied a multi-user virtual environment (MUVE) to enhance school students' motivation and higher order scientific inquiry skills, and to provide knowledge in biology and ecology. The River City learning environment was a virtual 18th century industrial city with a river running through it.

Students found River City to be motivational because the virtual environment and interaction features created feelings of curiosity. They felt like they were real scientists and were solving a sort of mystery. Because it was a 3D virtual environment, students also felt it was more active and collaborative. They could walk around and ask questions rather than just sit in a classroom and take notes.

While the aforementioned commercial worlds are currently in use and operational; Croquet, however, is still in its development phase. Educators in many fields from art to computer science

are excited about Croquet's attributes and promises, and although its first complete developer's version has been recently released, it is still being tested, modified and theorized about.

Croquet has a peer-to-peer collaborative environment, and uses a Squeak-based programming environment. It is more than a virtual world platform; it is an open-source network operating system. It has collaborative elements similar to those of SL and Active worlds, but so far it is only an educational project. It does work in a local area network (LAN) environment; however, I have not been able to find anyone using it in a classroom setting.

Croquet promises to be the future of interaction on the internet, but so far most of the literature is merely justification for the platform or technical explanations of its system. Since it is not a system that is easily or practically usable on a multi-user scale similar to those of the commercial worlds, it seems that Croquet should be a platform to keep an eye on for future consideration as a classroom educational tool (Lombardi & McCahill, 2005).

Leung and Chen (2001) believed that in the future, by using faster more powerful computers and higher bandwidth connections, more complex 3D models would be created and rendered to provide even more realistic environments. They felt that in a few years, the personal computer would no longer be merely a computational tool, but a communication tool as well. Many researchers and educators feel that this future time has arrived. Recent advances in hardware and connectivity say "now is the time" for multi-user collaborative virtual environments to be used in education (McCahill & Lombardi, 2004). I agree. In the ten years that I have been teaching college English, I have seen radical changes in the computer usage by my students. When I first started teaching, I had to take all of my students to the computing center and teach them how to apply for an email account. Now, almost all of my students have

computers and fast internet connections in their homes, and use computer technologies on a daily basis for both academic and social purposes.

2.7 Concerns and Issues with Virtual Worlds

Security

Issues in security are twofold; security of information and personal (avatar) security. Users are not in control of the worlds they inhabit. They don't own the hardware system and they aren't allowed access to the system's security system. For the casual user this may be a good thing. Someone else worries about these issues and the resident can concentrate on just using the world. However for a corporation or school, not being able to control the world means not being able to control who is in the world or what happens in there. It would be extremely unwise for any institution to store valuable or secret information in a world they could not secure themselves.

In September of 2006, Some unencrypted customer information including Second Life account names, real life names and contact information, along with encrypted account passwords and encrypted payment information was compromised (Linden, 2006)**.** A potentially even bigger problem in a virtual world is that of protecting intellectual property. A program, nicknamed CopyBot, enabled users to quickly copy characters, objects, and buildings that other users had created and often sold to other residents. CopyBot threatened to destroy the value of people's virtual property (Holahan, 2006).

Lastly, in cyberworlds there are even personal safety risks. As the avatar Anshe Chung was just about to begin an inworld interview with CNET, a "griefer" (someone who harasses other players in a game) disrupted the event by attacking the area with animated flying penises (Terdiman, 2006). There are even reports of virtual gangs that force residents out of public areas (Terdiman, 2006). While you don't actually get hurt in real life if your avatar is attacked in a

virtual world, there may be psychological risks especially for younger players. Not limited to

virtual worlds but in all kinds of digital media including blogs, and cellphones, cyberbullying is

on the increase. Cyberbullying involves the use of information and communication technologies

to support deliberate, repeated, and hostile behavior by an individual or group that is intended to

harm others. Bullies can harass victims about their appearance, sexual activities, income, grades,

diseases, or disabilities (Anderson & Sturm, 2007).

<center>*Cost*</center>

Many virtual worlds have some sort of free access account. However, if you want to have

a major presence or build house, a school or an island, you need to invest a good deal of real cash.

Linden Lab, the company that created and runs Second Life, has sold more than 100 islands for

educational purposes at about $1,000 each, plus $150 monthly maintenance (Lagorio, 2007).

Bruno (2006) stated the purchase price of the largest island at $10,000 US dollars with about

$300 a month in maintenance fees and even more when adding in development costs.

Czarnecki and Gullett (2007) suggested that if you couldn't afford the cost of purchasing

and maintaining an island in SL, you could try and partner with someone who could give you

land space to try it out for free.

<center>*Reliability*</center>

Taylor (1999) noted that when entering virtual worlds, you immediately had at least two

bodies: a corporeal one and a digital one. He has conducted interviews with online individuals

and reported that avatars commonly express the ability to behave freer or express themselves

more spontaneously than they do in real life. Related to this concept, some people expressed that

their real self changed depending on how they presented themselves online.

<center>60</center>

He also mentioned the difficulties in establishing the actual (offline) identities of the interviewee and the problems with verifiability and reliability of what the avatar told him. However, he says this is not specific to online research and there is much that has to be taken on trust even in an offline interview.

Accessibility

Besides the costs involved in maintaining a virtual world, there may be problems in just trying to visit one. Czarnecki and Gullett (2007) reported that the librarian Jean Gardner couldn't even access SL until she acquired the proper video card for her workstation. SL users need to know the system's requirements, which include a fast CPU processor, and a modern graphics card. The software is also updated on a regular basis, which requires reimaging every computer each time you load a new version of Second Life. The success of a virtual world depends not only on its content, but also on the time it takes for it to download and whether the user's computer has the power to show it satisfactorily (Williams, Pickett & Murphy, 2001).

Once you log in to a virtual world you are rewarded with an interesting environment, but perhaps overwhelmed with a bewildering and difficult to use interface. Fawkes (2006) felt that to really take advantage of Second Life's features, users needed to be proficient in computer aided design (CAD) or in computer scripting languages. He said that the myriad of tools available is information and option overload, and inhibits people from realizing their lives in the virtual world. He suggested that maybe there should be a version of Second life for the average user-something like a "Second Life Lite".

While existing virtual worlds may have many interesting features and exciting marketing potential. I feel it makes sense from the perspectives of security, cost, reliability, and accessibility to build and host your own virtual world system.

2.8 Virtual System

For reasons of control, security, accessibility and cost, I decided to use the freeware virtual server software called ABNet2 which was developed by Rick Kimball (Kimball, 2007). This software allows one to host multi-user virtual worlds on an ordinary personal computer. I have been a regular user of his software on my home computer, and understand its potential for use in a conversation class as well as its limitations regarding virtual world functions. In the past, I had tested another multi-user freeware, Blaxuun Contact, but in order to use the multi-user function, the software had to connect with the Blaxxun servers. That meant that if there was a problem with their servers, it was not possible to use the virtual worlds. There were other issues concerning unwanted visitors having access to the worlds, as well as regulatory and permission issues surrounding their software for noncommercial use.

In general, before you can use ABNet2, you must install software that will allow your computer to become a server to other computers. I used windows Apache 2.2 and also installed PHP 5.2 to allow for server side interaction and file upload capabilities for my student users. I also applied for, and received, a dedicated IP address from my school in order to allow outside connections to the computer in my office. I am not an expert in setting up servers or scripting software, but I know how to read instructions that are available on many online forums and web pages. I like solving problems and do not give up easily. At the time of this writing, the 3D browsing software that works best with ABNet2 is BS Contact from Bitmanagement which is downloadable and free to use for non-commercial testing and educational purposes (Bitmanagement Software GmbH., 2003).

Other major freeware used in this study included PhotoFiltre, Irfan View, Avatar Studio, Flux Studio, and Google Sketchup; all are available as freeware on the Internet. The main

advantage of using freeware, other than cost, is that students were able to install and use these

programs on their home computers as well as the ones in the classroom. Students were then free

to work on their assignments according to their own preferences and time schedules. All

freeware used in this study was downloaded from the Internet according to the rules and

regulations that each company mandated for their use. Screenshots of the agreements and terms

of use for each freeware product are included in Appendix B.

PhotoFiltre (DaCruz, 2007) and IrfanView (Skiljan, 2007) are graphics manipulation

software. They can be used to edit pictures in terms of color and shape, as well as convert images

into various, commonly used graphics formats such as JPEG or GIF.

Avatar Studio allows the creation of humanoid VRML avatars (Canal Numedia, 2000).

Physical characteristics such as hair color and body type, as well as clothing types such as pants

or jacket can be designed and adjusted. More complicated aspects such as avatar gestures can

also be adjusted.

Flux Studio is a 3D modeling and animation application (Media Machines, 2007). With

Flux Studio, users can create 3D objects and worlds. All object elements of color, size, distance

and interactivity can be manipulated. Flux studio allows the inclusion of audio and video files,

and can import and export the finished 3D scene into a variety of formats including VRML.

Google Sketchup is another 3D modeling application (Google Inc., 2006). Using Google

Sketchup, architectural and building-shaped objects can be quickly rendered in an easy-to-use

design environment, and users can share their models with others using the Google 3D

Warehouse.

Screenshots of the main software programs to be used in this study are shown in Figures
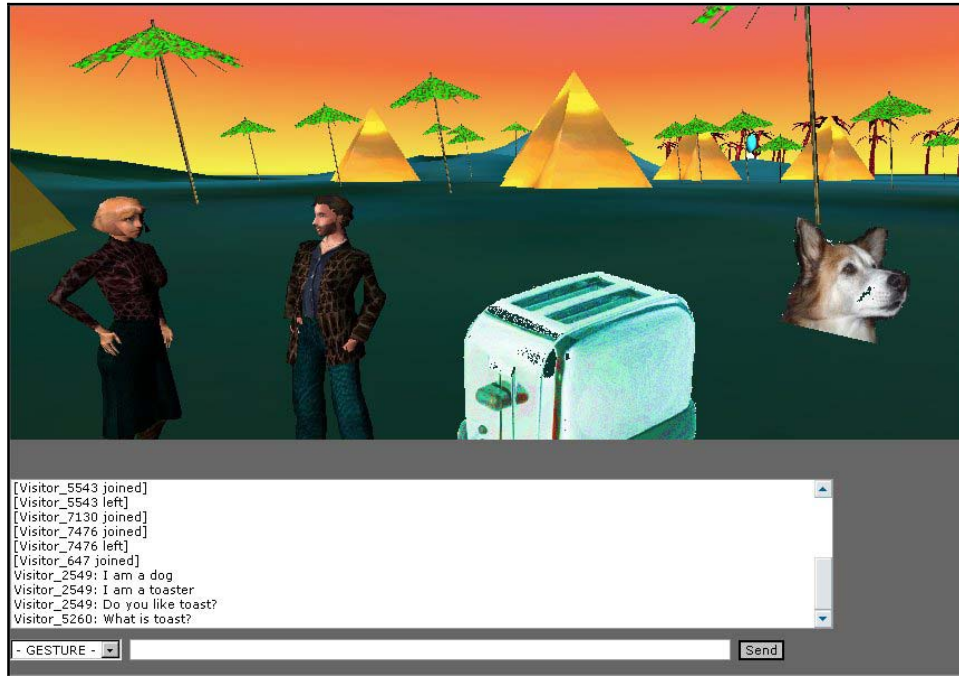
1, 2, 3, 4, 5 and 6.

Figure 1. Screenshot of ABNet2 Interface (Kimball, 2007).
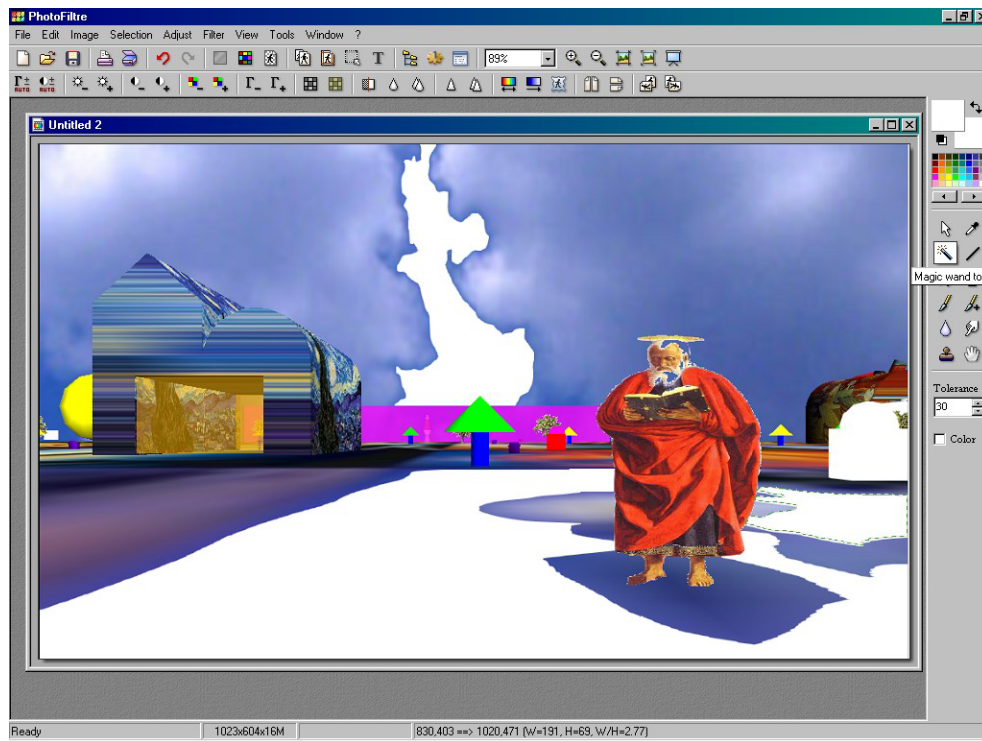   *Note*: Scene designed by Fulton.

Figure 2. Screenshot of PhotoFiltre (DaCruz, 2007).
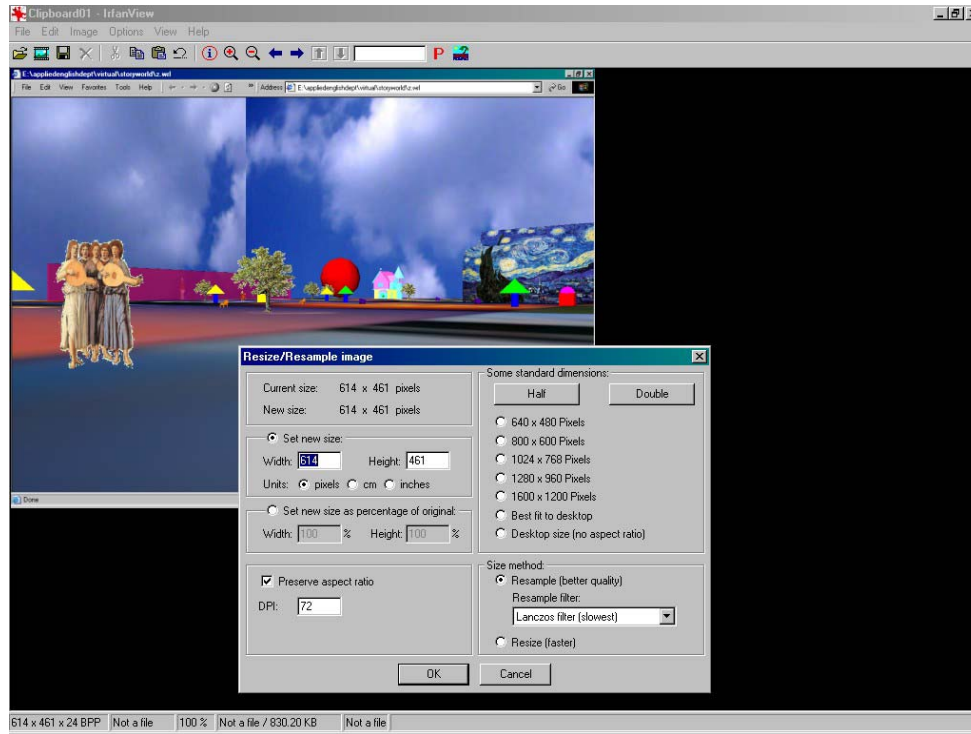   *Note*: Scene designed by Fulton

Figure 3. Screenshot of IrfanView (Skiljan, 2007).
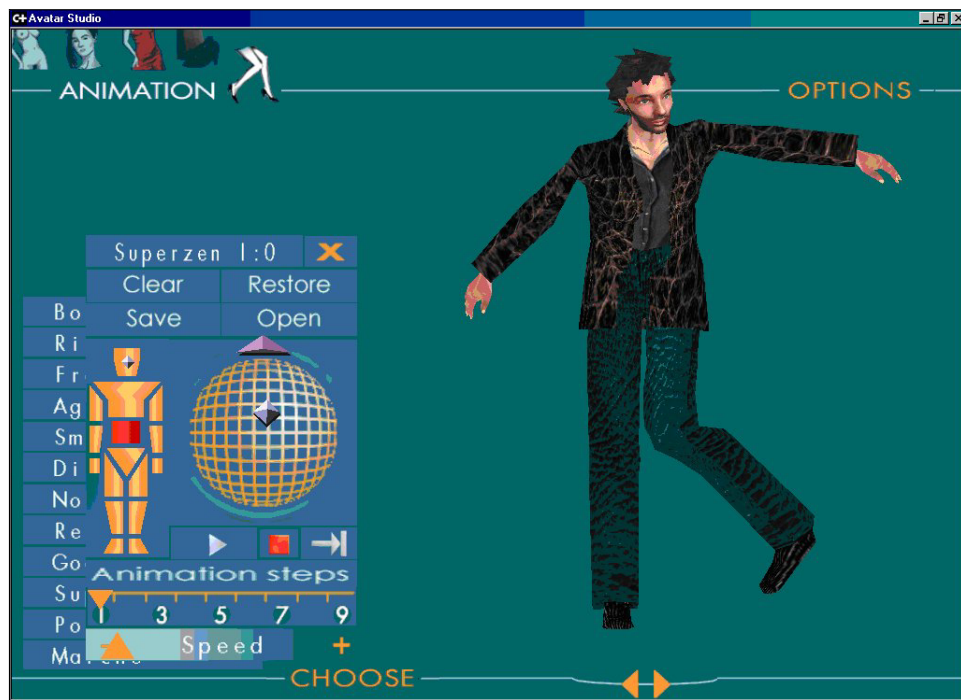   *Note*: Scene designed by Fulton

Figure 4. Screenshot of Avatar Studio (Canal Numedia, 2000).
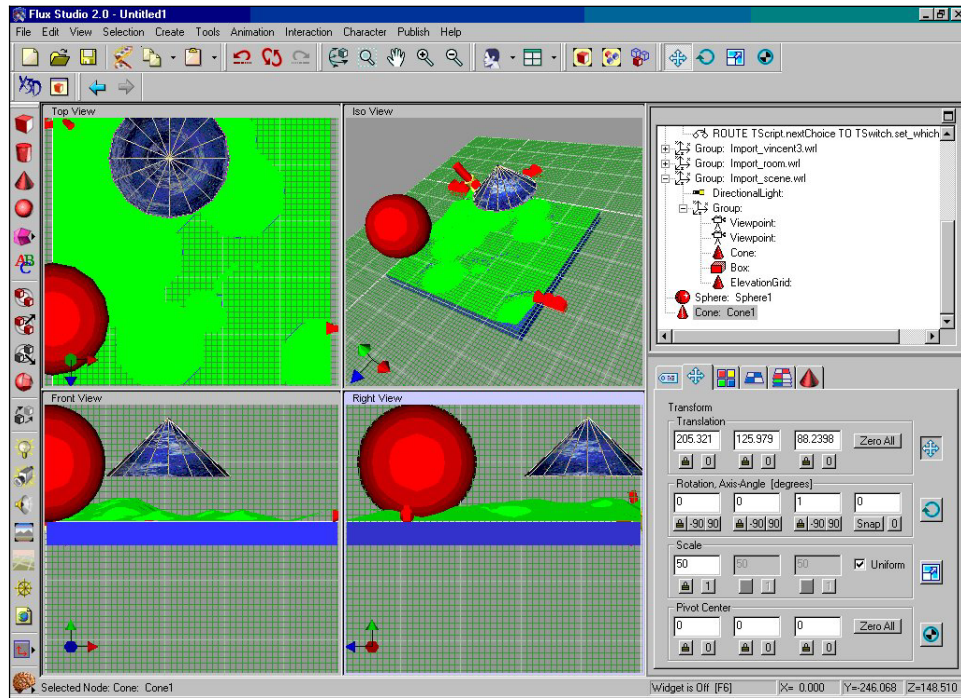   *Note*: Scene composed by Fulton.

Figure 5.   Screenshot of Flux Studio (Media Machines, 2007).
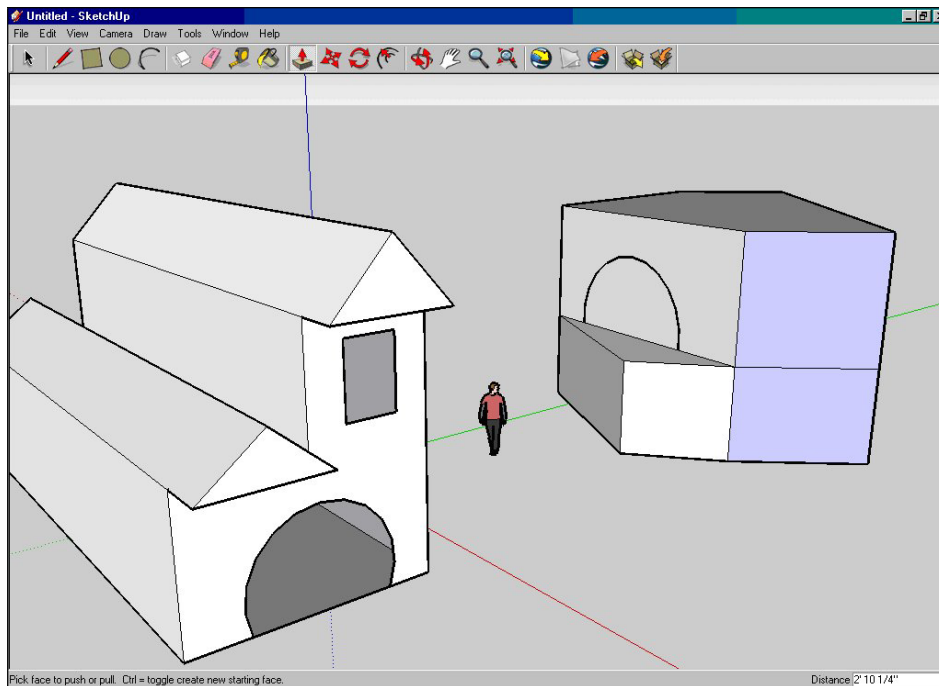   *Note*: Scene arranged by Fulton

Figure 6.   Screenshot of Google SketchUp (Google Inc., 2006).
         Note: Scene designed by Fulton.

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2.9 Summary

This section described 2D and 3D technological tools and reported their relationships to education. Constructivism and its importance to motivation was discussed, as well as the suitability of virtual worlds to provide a constructivist learning environment. Present day uses of virtual worlds from education to business were highlighted and current studies involving virtual worlds and language studies were reported. While some educational studies had used virtual worlds as minor course aspects, the current study looked at the construction of virtual worlds and motivation towards English as its core components. Finally, the rationale for the specific software and system used in the current study was outlined and explained.