

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

This section reports the results of the study. Following the mixed methods research triangulation methodology, the results of quantitative and qualitative measures are reported separately. Quantitative measures for the surveys are presented using paired *t*-test values for the pretest/posttest surveys and descriptive statistics are provided for the other surveys. Computer logs and student building records are also summarized and presented. Qualitative measures for student interviews and teacher observations were analyzed, reduced, categorized and presented. Finally, these results are considered in the context of the purposes of the current study.

4.2 Quantitative Measures

As mentioned previously, 13 men and 22 women took part in this study. There were originally 24 women who started the study but two of them did not complete the course due to academic and financial reasons. The results section presents data for the 35 participants who participated in the complete study. In analyzing the quantitative data, Microsoft Office Excel 2003 and SAS Institute JMP 5.1 were used in combination to determine and confirm the results of this study.

Surveys

Background

The background information consisted of two main types of information: General, English language training, and online computer usage. As mentioned in the previous section, the general information indicated that 13 male and 22 female students participated in this study, and that their average age was 20.51 years. They each spent an average of 9.77 years studying English

in school and an average of 3.56 years studying outside of the school system in private lessons or cram schools. Finally, their reported average self-rating of English ability was 2.89 using a five-point Likert scale ranging from “Very poor”= 1 to “Very good” = 5 (See Table 3).

Table 3

English Education Background Information

Survey Statement	N	Mean	SD
Age	35	20.51	0.70
Years of English in school	30	9.77	2.90
Years of English out of school	32	3.56	3.03
Self-rated English ability	35	2.89	0.72

Note: All 35 students took surveys, but varying N values indicate non-responded to items.

Background information also provided information regarding the students’ online computer usage and used a five-point Likert scale ranging from “Never”= 1 to “Very often” = 5. The categories of online use that received a 3.0 or higher were Instant messaging (4.11), Email (3.46), Video sharing (3.09) and Online information sites (3.00). The lowest category of usage was Virtual worlds (1.74). Students spent, on average, 18.72 hours per week performing online activities. In other words, students said that they spent around two to three hours per day online (See Table 4).

Table 4

Computer Usage Background Information

Online Category	N	Mean	SD
Email	35	3.46	1.07
Instant messaging	35	4.11	0.99
Online information sites	35	3.00	0.97
Online communities	35	2.60	1.17
Photo sharing	35	2.69	1.26
Video sharing	35	3.09	1.27
Personal web pages	35	2.51	1.46
Online games	35	2.57	1.37
Virtual worlds	34	1.74	1.05
Hours per week online	34	18.72	8.94

Motivation

Motivation information was collected using pretest/posttest surveys and provided information regarding virtual world building and usage on students' computer and English motivation. The motivation surveys used a five-point Likert scale ranging from "Strongly disagree" = 1 to "Strongly agree" = 5.

Regarding students' computer motivation, the results indicated a decrease in overall computer attitudes and motivation. The difference between the pretest (3.49) and posttest (3.31) means was statistically significant at $p < .05$. However, both values were well above 3.0 and are

viewed as solidly in the positive or favorable range for practical usages or evaluation purposes (See Table 5).

Table 5

Pretest/Posttest Computer Motivation Paired Means

Computer Motivation	N	Mean	SD	Two-tailed <i>t</i>
Pretest	35	3.49	0.51	0.01*
Posttest	35	3.31	0.55	

* $p < 0.05$

Looking at the posttest survey statement results, two out of 14 statements received negative mean values (below 3.00). Statement c4 “I want to continue using a computer in my English classes” received 2.89, and statement c13 “Computers are usually very frustrating to work with.” was rated 2.69.

The other 12 statements received positive assessments (above 3.00). The statements receiving the highest mean values were c8 “Learning how to use computers is important for my career (3.97)”, c1 “Learning to use a computer gives me a feeling of accomplishment (3.71)”, c2 “Writing by computer makes me more creative (3.54)”, c3 “Using a computer gives me more chances to read and use authentic English (3.53)”, and c7 “I enjoy the challenge of using computers (3.51)” (See Table 6).

Table 6

Computer Motivation Posttest Survey Statements

	Survey Statement	N	Mean	SD
c1	accomplishment	35	3.71	0.96
c2	creative	35	3.54	0.78
c3	authentic English	34	3.53	0.74
c4	continue using	35	2.89	1.08
c5	not worth effort	35	3.09* (1.91)	0.89
c6	more control	35	3.29	0.79
c7	enjoy challenge	35	3.51	0.78
c8	important for career	35	3.97	0.86
c9	learn independently	35	3.49	0.98
c10	people isolated	35	3.09* (1.91)	0.95
c11	learn faster	35	3.14	1.00
c12	practice English	35	3.17	1.10
c13	computers frustrating	35	2.69* (2.31)	0.87
c14	make people weak	35	3.20* (1.80)	1.11

* = reverse coded, number in parenthesis was actual value

Regarding students' English motivation, the results indicated no change in overall attitudes and motivation toward English. The mean value increased from pretest (3.87) to posttest (3.92), but it was not a statistically significant increase (See Table 7).

Table 7

Pretest/Posttest English Motivation Paired Means

English Motivation	N	Mean	SD	Two-tailed <i>t</i>
Pretest	35	3.87	0.40	0.24
Posttest	35	3.92	0.37	

Looking at the posttest survey statements, only one out of 22 statements had a negative mean value. This was statement m6 “I think I spend fairly long hours studying English” with a mean of 2.94. All of the other 21 statements received positive assessments (above 3.00).

As mentioned previously in the section on methodology, the three subsections of the English Motivation survey measure were: Motivational Intensity (MI), Desire to Learn English (DLE), and Attitudes Toward Learning English (ALE). Looking at the MI subsection the statements receiving the highest mean values were m6 “After I graduate from college, I will continue to study English and try to improve (4.23)” and m5 “I really try to learn English (4.00).” Regarding the DLE subsection, statements d6 “I find studying English more interesting than other subjects (4.06)” and d5 “I believe absolutely English should be taught at school (3.86)” received the highest mean values. In the ALE subsection, the statements receiving the highest mean values were a8 “Learning English is a waste of time (4.49-reverse coded, 0.51 actual value)” and a3 “English is an important part of the school program (4.49)” (See Table 8).

Table 8

English Motivation Posttest Survey Statements

	Survey Statement	N	Mean	SD
m1	compared to classmates	35	3.03	0.82
m2	think about words and ideas	35	3.77	0.55
m3	study English on my own	35	3.94	0.73
m4	spend long hours studying	35	2.94	0.84
m5	try to learn English	35	4.00	0.64
m6	continue to study English	35	4.23	0.73
d1	do assignments immediately	35	3.63	0.77
d2	read English newspapers	35	3.34	0.94
d3	concentrate on studies	35	3.69	0.72
d4	increase English classes	35	3.66	0.68
d5	English should be taught	35	3.86	0.94
d6	English more interesting	35	4.06	0.80
a1	English is really great	35	4.29	0.57
a2	enjoy learning English	35	4.17	0.71
a3	important part school program	35	4.49	0.51
a4	learn as much English	35	4.03	0.66
a5	love learning English	35	4.09	0.78
a6	hate English	35	4.31* (0.69)	0.72
a7	other subjects than English	35	3.49* (1.51)	1.07
a8	English is waste of time	35	4.49* (0.51)	0.61
a9	English is dull	35	4.37* (0.63)	0.65
a10	give up learning English	35	4.40* (0.60)	0.60

* = reverse coded, number in parenthesis was actual value

English motivation survey data were also analyzed according to survey subsections and showed overall positive assessments for the three subsections. All three subsections received average values above 3.50 with Attitudes Toward Learning English receiving the highest mean (4.20), followed by Desire to learn English (3.70) and Motivational Intensity (3.65). Table 9 provides the subsection results for English motivation.

Table 9

English Motivation Posttest Subsections

Subsection	N	Mean	SD
Motivational Intensity	35	3.65	0.54
Desire to Learn English	35	3.70	0.24
Attitudes Toward Learning English	35	4.20	0.30

Constructivist Learning Environment

Students responded to the constructivist learning environment using the CMILES survey which used a five-point Likert scale ranging from “Strongly disagree”= 1 to “Strongly agree” = 5.

The results of the 30 CMLES statements showed two statements which received negative mean values of slightly less than 3.00. Statement m24 “It is easy to use” received a mean value of 2.97 and statement m25 “It takes only a short time to learn how to use” received a mean value of 2.69.

All of the other 28 statements received positive mean ratings of 3.40 or better. The CMILES survey was divided into two subsections: The Process of Learning with the Multimedia Program (L) and The Multimedia Program (M). The first subsection dealt with the process of learning and the second subsection focused on the multimedia program itself. The four statements which received the highest mean values from the Process of Learning with the Multimedia Program subsection were l12 “I get to think deeply about my own ideas (3.94)”, l3 “I ask other students to explain their ideas (3.91)”, l11 “I get to think deeply about how I learn (3.91)”, and l6 “I find out answers to questions by investigation (3.86)”. In the Multimedia Program subsection, the four statements receiving the highest mean values were m28 “It is challenging to use (4.31)”, m26 “It makes me think (4.14)”, m20 “It has a wide range of information (3.95)”, and m30 “It helps me to generate new questions (3.94)” (See Table 10).

Table 10

Constructivist Multimedia Learning Environment

	Statement	N	Mean	SD
l1	talk to other students	35	3.83	0.71
l2	how conduct investigations	35	3.77	0.73
l3	explain their ideas	35	3.91	0.61
l4	explain my ideas	35	3.57	0.70
l5	discuss their ideas	35	3.69	0.87
l6	answers by investigation	35	3.86	0.77
l7	test my own ideas	35	3.63	0.73
l8	follow-up investigations	35	3.69	0.68
l9	design my own ways	35	3.57	0.78
l10	more than one perspective	35	3.77	0.65
l11	think how I learn	35	3.91	0.66
l12	think my own ideas	35	3.94	0.68
l13	think about new ideas	35	3.83	0.71
l14	think become better learner	35	3.77	0.65
l15	think own understandings	35	3.83	0.62
m16	complex real-life environments	35	3.74	0.89
m17	data in meaningful ways	35	3.46	0.85
m18	information that is relevant	35	3.54	0.70
m19	realistic tasks	35	3.60	0.77
m20	wide range of information	34	3.95	0.77
m21	an interesting screen design	35	3.89	0.80
m22	easy to navigate	34	3.49	1.04
m23	fun to use	35	3.40	1.14
m24	easy to use	35	2.97	1.15
m25	short time to learn	35	2.69	1.11
m26	makes me think	35	4.14	0.81
m27	complex but clear	35	3.51	1.04
m28	challenging to use	35	4.31	0.72
m29	generate new ideas	35	3.91	0.69
m30	generate new questions	35	3.94	0.68

Constructivist learning environment survey data were also analyzed also according to survey subsections and showed overall positive assessments for the two subsections. Both

subsections received average values above 3.60 with The Process of Learning with the Multimedia Program receiving the highest mean (3.77), followed by The Multimedia Program (3.63). Table 11 provides the subsection results for the constructivist learning environment .

Table 11

Constructivist Multimedia Learning Environment Subsections

Subsection	N	Mean	SD
The Process of Learning with the Multimedia Program	35	3.77	0.12
The Multimedia Program	35	3.63	0.43

Computer Logs

Students used the virtual system both in and out of class to communicate with their classmates. In class, students sometimes were instructed to discuss aspects of their virtual worlds, such as describing avatars or story information, and they were also told to meet a classmate outside of class to discuss the weekly conversation topics. Students were not told that they would get a better grade if they chatted more and the teacher was not allowed to look at the chat data because it might influence the way he taught or instructed the class.

The computer log produced over two million lines of code or over 52 thousand pages of data. Using Microsoft Word and filtering techniques this enormous amount of output was analyzed and reduced to reveal lines of student chat only. Online conversation chat activities started in the second week and continued two weeks after the final virtual world projects were submitted. In general, the highest activity for total lines of chat was at week 4 (506 lines) and week 7 (536 lines) and lowest at week 5 with only three lines (See Table 12).

However, this amount and usage of chat was somewhat tied to class activities. During some weeks, students were allowed or required to use the system for in-class conversation

activities and therefore do not reflect students' voluntary usage. A better way of looking at the system computer records might be to look only at the lines of chat which were logged during the times that class was not in session.

Table 12 also shows the week by week amount of chat by students during times where they were not in class. This showed usage to be greatest during week 7 (423 lines) and week 4 (381 lines) with almost no usage during week 5 (2 lines) and week 9 (1 line). Basically, it showed an increase in usage at the beginning of the course, then a lull during and after midterm exam week. This was followed by a fairly steady amount of usage until the week preceding and during the final virtual world presentations. After the final project presentations, usage picked up again then dropped off sharply after the course ended.

Table 12

Chat Lines by Week

Week	2	3	4	Midterm	5	6	7	8	9	10	After final	After final
Total chat	345	488	506	79	3	370	536	425	82	47	182	366
Out of class chat	13	148	381	30	2	288	423	327	1	46	178	42

Note: During weeks Midterm and After final, there was no in-class training or instruction.

Student Building Reports

Prior to week 4, software usage and conversation activities focused on image processing and virtual system practice. Starting in week 4, students were introduced to their final project of producing a virtual world based on a story, and at this time they actually started working with and creating simple virtual worlds. By this time students had been introduced to several software products and were starting to become familiar with their weekly activities. They were at a point

where they could begin to put the skills they had been taught to practical use. Students were instructed to keep a weekly log of the time they spent outside of class working on their virtual worlds. They were not told of a minimum time they needed to spend each week and no attempt was made by the teacher to link the amount of time spent outside of class with their final story world project grade.

Table 13 shows that the amount of time each week spent outside of class was fairly constant at less than one hour per week until it started increasing in week 7 (1.70 hours). After that, it increased to 3.51 hours in week 8 and in week 9, before the final project was due, jumped to 7.94 hours.

Table 13

Student Outside of Class Building Reports

Week	N	Ave. Hours	SD
4	35	0.58	0.76
Midterm	35	0.57	0.60
5	35	0.39	0.49
6	34	0.59	1.38
7	26	1.70	3.25
8	34	3.51	4.07
9	33	7.94	7.56

Note: During Midterm week, there was no in-class training or instruction.

4.3 Qualitative Measures

Interviews

In addition to the previously described narrative profiles provided in Appendix J, the interview data was also analyzed and organized into major categories of thematic topics. These twenty themes are listed below according and representative quotations from the interviews are included to provide context and actual interview content. In general, the themes are listed in the

order of the interviews; themes from the first interview are presented first and themes from the third interview are presented last. All names used in this study are pseudonyms, and identifying comments from the interviews have been modified or removed.

Reason for choosing this University

The most common reasons for attending the Applied English department were having adequate test scores or that the school was near their homes. They all stated to like English, except Doug who said he did best in math.

Francine: “Everybody speaks English because English has become a skill to communicate.” SFF1

Encouragement for studying English

Most students decided to continue studying at the University level by themselves; although, a few stated some encouragement by others- Annie- her high-school teacher, Calvin- his uncle and parents, and Grace- her mother.

Calvin: “My uncle told me he didn’t get very [high] pay because his English was not very good.” SMC1

Studying abroad

Several of the students had been to America to visit relatives or study. Three students, Doug, Francine and Grace, took summer vacation visits that combined aspects of short-term instruction and staying with relatives or friends; whereas, one student, Eddie, attended elementary school for a year and a half. Annie, Barbara, Doug stated that they would like to study abroad after they graduate.

Eddie: “My aunts asked me if I wanted to study [in America] - I just answered ‘Yes’. People there were so friendly, and helped me a lot.” SME1

Future employment

Most the students thought that English would be useful for their future employment
Eddie and Calvin indicated that they would like to become teachers.

Eddie: “I think I will teach English; teach elementary school or kindergarten.”
SME1

Computer usage

Most students used computers for a mix of school and social activities with writing reports using Word, and PowerPoint, and chatting using MSN as being the most common usages. The exception was Doug who liked to play the online game “World of Warcraft”. Annie and Calvin mentioned having personal web sites or writing on blogs.

Doug: “When I play games, it’s fun. When I try to finish the report, it’s convenient.” SMD1

Computer access

All students reported having easy access to a computer where they lived. Seven of the students lived at home, and one lived in the school dorm. They varied in their stated daily computer usage from a minimum of two hours to a maximum of ten hours, with most of them reporting about two to three hours per day.

Francine: “I think it’s not healthy because using the computer is bad for your eyes.” SFF1

In-class activities

All students talked about using computer software to make virtual worlds as a major component of their in-class activities about the story that they chose. Doug, Eddie, Francine, and Heather specifically mentioned Flux Studio by name; some of them mentioned it several times. Both Google SketchUp and IfranView were mentioned by Annie, Doug, and Eddie, and PhotoFiltre was listed by Doug, Eddie and Francine.

Doug: “I use a lot of programs- like Flux Studio and Google SketchUp and search some pictures to put in my world. I use Irfan, I take out the background and use Flux Studio to put a box in there.” SMD2

Help in learning

Step-by-step teacher instruction and examples were considered to be an important part of the class by Annie, Calvin, Doug, Eddie, and Francine. In addition, all of the students except Barbara mentioned that they discussed the operation of the software with their classmates or taught each how to make objects or use functions both during and outside of class time.

Francine: “I use the software to make virtual worlds, and pay attention to what the teacher says and what to do. He tells us how to make every step to build a virtual world and discuss with classmates.” SFF2

Annie: “We’re always asking questions in class- how to use this or that, so we didn’t chat about other [things]. After class, we always wonder how to use the system, so we didn’t chat too much not about school in class- just always wondering how to use the system. SFA3

Calvin: “There is a lot of computer software in the self-education classroom and I don’t know it very well, so I will check the vocabulary and try to understand what function it is and know how to use it and ask my classmates how to use it.” SMC2

Story world

They all talked about their virtual worlds as being based on a story or movie that they chose by themselves. They talked about the various images, 2D and 3D objects, billboards, sounds and models that they put in the worlds and that their stories guided their decision making for which items to include in their virtual worlds.

Francine: “You can put anything you want to- like characters, animals, anything models, buildings, trees, bridge- stuff like that. [The virtual world] is realistic.” SFF2

Calvin: “I think it is important before I describe the world, I understand what [the characters] are doing and what happens in the story and what gestures they do and what buildings and what furniture is necessary in the {forest} because they are {fighting} in the {forest}.” SMC2

Class web page

Annie, Annie and Grace mentioned that there was a class website page where they needed to write some homework on the message board. Annie, Doug, and Calvin talked about spending time reading the online virtual world building instructions and Annie mentioned viewing the online demonstration videos.

Barbara: "I will just read the messages, listen the demo and practice. [The website has] the directions and you can see the steps. [I do this] at my home and there is also some work." SFB2

Conversation

Using the virtual system for chatting in virtual worlds was reported as being an important activity for everyone. However, they differed in when they said this conversation occurred.

Annie, Francine and Grace said they spent time outside of class While Calvin and Heather just mentioned it as an in-class activity. Doug and Eddie said they used the virtual worlds for conversations both in and out of class time.

Eddie: "we use the software in our home or in school with some of our classmates, and we practice it out of class and use the Vircon system to have conversations with each classmate to improve our English. Talking and playing with the virtual world at the same time, and [using] the virtual world we made in the class or out of class." SME2

Value of using computer

Students had very different opinions on the value of building and using virtual worlds. Annie and Francine didn't feel that building virtual worlds could improve their conversation abilities while Calvin, Doug, and Eddie felt that using the software, which was in English, helped them learn new vocabulary words and improve communication abilities.

Francine: "I think chatting in English can help my English, but I don't think building a virtual world can improve my English. Because the virtual world system is all in English, so you have to know how to open the file and how save the file in English- not in Chinese." SFF3

Calvin: “I think I can learn many things by the software and the teacher and some books because the software is all typed in English – so I can learn a lot of vocabulary which I didn’t know.” SMC3

Value of chat

The virtual conversation activities also received varied opinions with Grace and Heather stating they would rather have used a traditional textbook for their focus, whereas Annie, Calvin, Doug, Eddie and Francine all felt that the conversations in virtual worlds were useful for improving their English conversation skills.

Heather: “In the worlds, I just talk about nothing. How are you doing? I’m fine-just talk. Sometimes, because I don’t know what to do in my world, so I ask my friends how to do that.” SFH2

Francine: “I met my classmates in the chat room, but it’s the virtual world chat room. So, we can discuss and look around each other’s virtual worlds. You can have opinions and talk- “How do you make this tree? Your world is not-so-good. Your world is boring. Your world is pretty. Your world is better than mine.” SFF2

Visiting classmates’ virtual worlds

All of the students talked about the usefulness of being in the virtual worlds towards understanding the stories of their classmates; most mentioned the value of seeing the objects, listening to the music and reading the informational billboards. Being in these worlds gave them realistic feelings of peace, excitement, or even fear – depending on the worlds they were in. Many of them talk about being able to move around in these worlds and Annie, Eddie and Heather specifically mentioned the avatar or person that represents them as being an important feature of feeling like they are in the world.

Grace: “I am comfortable and relaxed because I can hear the sea wave sounds and the background is some sets which I like very much. And, the place is big.” SFG3

Eddie: “The scenery in that world is very bright and beautiful and calm. I can see a lot of snow and trees that are full of snow and a castle and some mountains and the characters in there.” SME3

Annie: “[When I am in the virtual world, I] feel it’s kind of fun and interesting because I never have done that before. And, the most interesting is – there’s a person in there and you can walk around or- like sightseeing in a different world.” SFA3

Future use for chat

Annie, Eddie, Francine, Heather focused on the chatting aspects as those that would be most valuable to them. Eddie and Heather said that they would like to use the system to make new friends or speak English to people in other countries; whereas Annie and Francine pointed out the value of just using the virtual world system to discuss their worlds or other topics in English to their classmates because they usually don’t communicate with each other in that way.

Eddie: “I can use the Flux Studio and show the people what I made and just can have a party in the virtual world. I could use it to communicate with my foreign friends. [Talking with] strangers is OK- just speak in English and get more practice with any kind of people – just communicate with them.” SME3

Heather: “We can use the virtual worlds to use English and to talk to them. I can introduce [my world] to my friends and say – this is my world and I make it from nothing, and I have this world - I did it.” SFH3

Future non-building uses for software

A few students mentioned being able to use the software for purposes other than world building might be useful in the future. Calvin thought Google SketchUp would be useful for architecture and Doug thought that the image possessing functions of IrfanView and PhotoFiltre would be most useful to him in other classes and in future employment.

Calvin: “[If] I am in architecture, maybe in the future, I will use Google SketchUp to do some special building and maybe put [it] into PowerPoint and show my boss or show my friends.” SMC3

Future world building

Calvin, Doug, Eddie, and Heather thought that using software to build worlds helped them think about things using English. These four students plus Francine mentioned that they

might like to continue virtual world building in the future with Doug and Eddie specifically mentioning Flux Studio as the primary world building software.

Doug: “If everybody has the program Flux Studio and the AB2net, maybe we can have conversations in there like in MSN. That would be great. When you click others in MSN it’s only a little page, but when you want to talk to others with Flux Studio you can build a world- it will be fun. Maybe I could do- where is a beautiful place in Taiwan? like Danshui.” SMD3

Feelings of accomplishment

Although these students had not participated in virtual worlds before and were novices at using technical software and building virtual worlds, Calvin, Doug, Eddie and Heather expressed positive feelings about using the world building software.

Doug: “At first, it’s just for class. I do that for the class- but, actually its fun, it’s not boring. When you try a lot of things, you do a lot of worlds, you build a lot of buildings in your world and you hit Ctrl + F5 - you can see the world. It’s nice – you see what you did - fun.” SMD2

Beyond the required activities

Annie, Calvin, Doug, Eddie and Francine all mentioned aspects of the class that went beyond the specific use of software or conversation activities. Francine thought the environment encouraged her to search English websites. Calvin thought he could use the demonstration of virtual worlds to stimulate conversation with native speakers of English. Eddie felt he could use virtual worlds for presentation purposes or to have a virtual party. Using all the English software tools, but especially, using the information on the class web site, Vircon, gave Doug experience and confidence to start reading other English language web sites. Annie thought that the most important aspect of the class was the total English language environment that it provided, and wished that more classes and subjects could be taught in a similar manner.

Doug: "I think the most important is the web page- the Vircon web page- it's all English, so I start to read the NBA web site in English. Usually I will go to Chinese NBA web site, but after the conversation class I started to try to look at the English NBA web site." SMD3

Teacher Observations

Weekly teacher journal notes were reduced and organized into the following major thematic categories. These six themes are listed below and representative quotations from the teacher's journal are included to provide course context and content.

Software and conceptual difficulties

Students were novices to computer technology in general and virtual world building in particular. Every aspect from navigating to real world English language web sites to downloading and installing software were new experiences for the students. Most students had never even used the school's CIP system to transfer files from desktop computers to the school's central online computer system. Students were also new to the exactness and inflexibility of computer usage, for example they had to learn that a folder called "Images" is not the same as a folder called "images". It also took many of the students a very long time to understand that a virtual world that was constructed on their desktop computers would need an exact copy of the environment on the school's online system. Although many difficulties occurred due to the necessary learning curve in software operation, there were no reports of software malfunction or system hardware failure.

"Students had many problems with the saving of various files- many didn't really save a transparent background" T2

"Lots of errors in making the 2d avatar (especially the YOUR NAME.gif)" They didn't type in their names- they used "YOUR NAME.gif" T2

"Some of the students still can not do simple things and don't even understand the basics of software vs. webpage." T6

“Many students don’t get how stupid computers are – you need to use exact words or capitals or spaces.” T7

Collaboration and Helping

Students were continually discussing with each other how to use the software and system. Some students who were more technically oriented, had practiced more or who were just better able to understand the teachers instructions spent time helping his or her classmates. Sometimes these more competent students were sought out by other classmates and sometimes they made an effort on their own to help others. This collaborative helping was not only useful but necessary because the teacher was not able to personally help every student with every problem.

“Although I spent a lot of time trouble shooting, the students themselves were going around and helping each other. I think the momentum is here for them to be successful.” T7

“They were all working hard and helping each other. I tried to answer as many questions as possible, but still lots of image problems and finding object problems and having messy world problems. I did try to explain again about starting slowly and adding a few objects then save- repeat.” T8

Scheduled tasks and assignments

Because all conversation and building activities were designed, established and set prior to the course, no adjustments in time or modification of activities were allowed. Due to this set schedule, activities were carried out but not necessarily completely internalized by the students. In each class, after a very short introduction, students were given step-by-step instruction in using the software. Much of their in-class time was spent working with the software and learning how to produce objects or worlds related to their stories.

Many journal entries commented on the rushed nature of the classes. It was usually the conversation activities that were shorted as a result of more time being required to adequately cover the building topics.

“Time felt rushed and I don’t feel students have retained a lot of basic info, so today’s lesson maybe went in one ear and out the other.” T8

“They seemed to enjoy the task of looking at the worlds and talking about them online- seemed to be more engaged in that task than actually talking to a non-self-chosen classmate.” T11

“Three women told me how much they liked visiting the beach and seeing the sunset of one of the example virtual worlds and how they enjoyed sliding down the water slides in the other, but no one else said anything about what they did outside of class.” T9

Student activity

Several of the weekly units seemed to excite students more than others. While they did not express much enthusiasm when introduced to placing information billboards in their worlds, they couldn’t stop talking about seeing their 3D avatars moving around the virtual spaces and later when they finally could see completed worlds with objects, textures, buildings and sounds, they expressed admiration and enjoyment at visiting such sensory rich and interesting places. Students also spent a lot of time on the construction of their virtual worlds.

“I think they are sort of understanding that the project is integrated- not a lot of discrete lessons, but one important world that they must understand and build, and talk about. They really liked to be in my z world and see the billboard... and they really liked the house with the stairs- I showed them that that was a ‘found’ object and where to find it. I think they now see the purpose of it for their worlds.” T7

One of the students told me “You must be very proud of yourself.” “Why?” I asked. “I have never seen my classmates work so hard on any other project they’ve had to do for school.” replied the student. T8

Extra work

Not only did the teacher have to produce instructional materials for the web site and create material for in-class demonstrations, but starting in the seventh week a great deal of energy was spent helping individual students with their individual worlds using outside-of-class help sessions. The teacher scheduled four extra help sessions when he would be in the computer lab to

help anyone with problems that they were having. Three extra help sessions were held on Thursdays, and one last session was held on Monday of the week of the final presentations. Many times it was the same students who needed help, but several of these students who received help stayed in the classrooms to help their classmates with similar problems. Almost all of the problems dealt with using Flux Studio to create the final virtual world.

“Thursday office (lab) hours session was good- about 10 people came. They were surprised to see each other.” T7

“I think people are just filling their worlds with stuff without saving little pieces- it will cause more problems.” T8

“Note- this project required me to do a lot of tutoring and trouble shooting- if I didn’t put in the extra time- I don’t know if they would have- and there would also be a lot more problems (for example – jpg vs. JPG) textures not showing up due to being too large or too small.” T10

Final project presentations

Only three out of thirty-six projects failed to meet the minimum requirements for world building and presentation. Most students had not only given a lot of thought to which story to tell and which elements to include in their worlds, but also revealed some of their personal characteristics as well. For example, quieter students produced more serene and tranquil worlds, more outgoing students produced more active or boisterous worlds, and many other students included some unusual or quirky elements that helped to define them as individuals. They also were very respectful and attentive to their classmates’ presentations and enjoyed going into the virtual conference area to visit, describe and comment on their classmates worlds.

“All students paid close attention, with very little chit-chat going on during the presentations and were interested in each other’s worlds. Students were impressed by the work and detailed information and building ability by several students and showed this by ‘oohs’ and ‘aahs’ of appreciation.” T10

“The level of information and sophistication of the presentations was in line with the level of work demonstrated by the virtual worlds- i.e. Students with better worlds generally gave more detailed and better presentations.” T10

“The class spontaneously broke into a round of applause (I did not start or suggest it). It seemed a fitting end to the semester and instead of rushing off to pursue other activities, I had to remind/persuade the students to leave the classroom.” T11

Teacher observation matrix

In addition to the thematic categories and teacher journal quotes, and providing an alternative method of understanding the classroom learning environment, the teacher observation material was organized into the following matrix that is organized by week and notes three main categories of classroom attitudes and behaviors: student difficulties, student reactions, and teacher reactions (See Table 14).

Table 14

Teacher Observation Matrix

Week	Student difficulties	Student reactions	Teacher reactions
1		Understood surveys	Students took tasks seriously
2	2 D avatar transparent backgrounds; Errors in 2D avatar.txt .wrl; Student personal files location	Excited about 2D avatars	Most students had not installed software at home; Students had difficulty in logging on to Vircon system
3		Very excited seeing the 3D avatars move	½ of students had home computer setup; Students understood logging on to Vircon system
4	Resizing and duplicating objects		No one had installed Flux Studio at home;
Midterm		Shared information with other students; Able to describe worlds in English	Only about 6 students made complex worlds
5	Difficulty understanding “images” folder	Some students still having problems with basic activities of adding objects	Most students reported not working or meeting partners
6		Impressed with adding image textures to objects and backgrounds;	Student individual web storage areas indicate few building uploads
7	Starting to understand computer vs. online system file relationship	Starting to understand story world building is integrated project, not discrete events	Met with over 10 students outside of class to work on basic ideas and troubleshooting
8	Students filled worlds without making backup objects or worlds	Students felt rushed and too much information	Students who have been absent or not working are not able to keep up
9	Many basic ideas had to be reviewed; .JPG vs. .jpg	Students showed increased energy level and ability to use the system	A lot of student help
10	Some presentations less than 2 minutes	Student paid close attention to worlds and presentations	Dozens of students showed up for outside of class practice and help; Students helping others
After final		Understood surveys; Relief to satisfaction	Most worlds met minimum standards and many were very good
			Students worked harder than typical course

Note: During weeks Midterm and After final, there was no in-class training or instruction.

4.4 Separated Summary of Results

Using the mixed methods triangulation methodology, the results of the study were analyzed and reported separately. In order to provide an overall perspective to aid in their understanding and to set the stage for the next section's discussion of these results, they are briefly considered using the perspective of the three purposes of the study as stated in Chapter 1.

Regarding the first purpose of the study, investigating the relationship of virtual world construction and object building, and communication activities to EFL student motivation, the quantitative pretest/posttest surveys failed to show an increase in motivation. However, the overwhelming number of posttest statements received favorable student responses. 12 out of 14 posttest variables indicated positive orientations towards computer use and 21 out of 22 posttest statements showed positive orientations toward English. Computer chat logs showed that students did use the system, but not all students took advantage of the system out of class. Student building logs showed students expended a great deal of time to complete their final building projects.

For the qualitative measures, the interviews indicated that students paid close attention in class and collaborated with other others in order to complete the challenging building tasks. Teacher observation journals showed students worked hard in every class, and that their motivation increased as they better understood the relevance of the tasks toward their final project. They also indicated that many students spent outside time in receiving extra help from the teacher and other students.

Regarding the second purpose of the study, understanding student experiences and concerns regarding virtual world construction, object building, and communication activities, the qualitative results from the surveys on motivation showed that although students found using

computers to be frustrating and did not want to continue using computers in their English class, they also found that using computers gave them feelings of accomplishment, gave them more chances to read and use Authentic English, helped them to learn more quickly and allowed them to feel that English was more interesting than other subjects. The results of the constructivist learning environment survey were overwhelmingly positive, with 28 out of 30 statements receiving favorable responses. The survey results showed that the course provided students with a wide range of information, helped them to think deeply about course topics, and encouraged discussion.

Both qualitative instruments, interviews and teacher observations, showed that most students found the experience to be novel and useful, and that the overall English language environment added to that usefulness.

Regarding the third purpose of the study, providing information regarding using virtual worlds design tools, and communication activities, the students indicated via their generally positive statements on all surveys that the building and conversation activities of the course were motivating and provided a constructivist learning environment. Computer chat logs showed the system was not uniformly used, but building records showed that students were willing to spend many outside of class hours to complete their projects.

Qualitative measures showed that Flux Studio was the software which students commented on the most and that was the most challenging and rewarding to use. Teacher journals showed that most student problems were directed towards Flux Studio use, but that most students were finally able to complete satisfactory worlds and presentations. Student interviews and teacher journal entries showed that students were able to successfully carry out both conversation and building activities of the study. Teacher records also indicate that conversation

activities and computer activities were not given equal teaching weight in class, with computer activities requiring and receiving greater consideration. Finally, there were no reported incidents of hardware failure or software malfunction.

4.5 Discussion of Results

The discussion uses the four research questions of the study as stated in Chapter 1 as a framework towards addressing and discussing the results of the study.

1. Can building and using virtual worlds increase university students' motivation toward learning English?

The motivation pretest/posttest comparison indicated that building and using virtual worlds did not increase motivation. However, since the motivation pretests and posttests only contained statements about general computer and English factors and did not specifically address the environment of the current study, and because this conversation course was not the only English course that the students were taking during the time of the study, as they were also concurrently taking other computer classes, it is possible that their responses on the posttests were due to experiences outside of the parameters of the current study. Nevertheless, it is probably more realistic to believe that students were basing their statements on the course in which their surveys were issued.

A more likely explanation of the results could be the relationship of pretest to posttest information itself. Students compared a nonspecific, unidentified, and not yet experienced environment in the pretest to a specific, difficult, and undergone set of activities for the posttest. In other words, they compared something they didn't know about in the pretest with something they knew about in the posttest.

Another way to consider the pretest/posttest comparison is to look at it under the light of previous studies regarding second language English motivation. In research discussed earlier in Chapter 2, while many researchers assume the stability of the attitudinal and motivational variables, some studies have found these variables to be somewhat malleable (Gardner, 2001; Masgoret and Gardner, 2003). However those studies involved either a much longer timeframe of nine months or an intensive six-week summer program to demonstrate changes in language motivation. Perhaps, the length of time was not long or intensive enough to produce an increase in language motivation using the motivation instrument of the current study.

Assuming students based their posttest evaluations on the activities and environment of the study, the posttest results provide some insight to the actual study motivational environment. The computer motivation posttest survey results showed positive responses in 12 out of 14 statements. These included: Learning to use a computer gives me a feeling of accomplishment (3.71), I enjoy the challenge of using computers (3.51), Using a computer gives me more control over my learning (3.29), Writing by computer makes me more creative (3.54), Using a computer gives me more chances to read and use authentic English (3.53), Learning how to use computers is important for my career (3.97), and I can learn English more independently when I use a computer (3.49).

Posttest English motivation survey results showed positive responses in 21 out of 22 statements. These included: English is an important part of the school program (4.49), I find studying English more interesting than other subjects (4.06), I really try to learn English (4.00), I often think about the words and ideas which I learn about in my English classes (3.77), I would like the number of English classes at school increased (3.66), After I graduate from college, I

will continue to study English and try to improve (4.23), During English classes I'm absorbed in what is taught and concentrate on my studies (3.69), I really enjoy learning English (4.17).

Student interviews revealed that they found using the computer software had motivated them to stay focused on class activities or motivated them to continue their discussions of world building activities outside of class. In addition, for some of them, just using the software in itself was a motivating experience.

Eddie: "I learned about how to use the computer- I learned a lot. I learned a lot of vocabularies in Flux Studio and we can talk to each other like- in the MSN, but not the same. We have to describe the things we have seen, and that can improve my English speaking. I made a house with another program – Google SketchUp and just put in Flux Studio. I think Flux Studio is just a lot of fun." SME3

Heather: "And finally, I know what to do and I can teach my friends how to do [things]. I don't know everything, but a little- about pictures and billboards- I can teach my friends. I can do it." SFH3

2. Can virtual worlds provide an effective and appropriate environment to encourage EFL students to communicate in English?

The constructivist multimedia learning environment survey showed the favorable constructivist learning environment of the study. The only statements to receive negative assessments were those that mentioned that the system was neither easy-to-use nor took a short time to learn. As Jonassen's (1998) research on mindtools indicated, using computers didn't make learning easier and effortless. On the contrary, the benefit of using mindtools was in learners having to think harder and more meaningfully than they would have to do without the tool. Student responses to the survey statements showed that the current study's system was neither simplistic nor insubstantial. The constructivist multimedia learning environment survey results showed positive responses in 12 out of 14 statements. These included: It is challenging to use (4.31), I get the chance to talk to other students (3.83), It has a wide range of information

(3.95), I get to think deeply about my own ideas (3.94), It helps me to generate new questions (3.94), I get to think deeply about how I learn (3.91), It shows how complex real-life environments are (3.74), and I approach a problem from more than one perspective (3.77).

Learning how to use the system did take time and effort as evidenced by the teacher journal and student interviews. In the interviews especially, it was the overcoming of the difficulties that led students to talk more about it, learn more about it, value its use in the learning of English and gave them feelings of accomplishment when they were finally able to use it. The computer chat log information was less informative. While students did use the system out of class, some of them did not use it regularly or intensively.

During the interviews, all students reported that they used the virtual system for chatting about conversation topics; however, one student specifically remarked that he used the virtual system for chatting when he had free-time during class. Perhaps other students thought this voluntary usage during class time or during class break-time fulfilled their outside of class chat activity requirement. In addition, because no attempt was made to influence chat use by making chat records open or as a part of the graded material of the class, perhaps students did not feel encouraged to use it more.

Two of the interviewed students' views on using the virtual worlds for chat improved towards the end of the course from the second to the third interview. They found that they could have meaningful discussions about their classmates' virtual story worlds and that virtual chat afforded them the opportunity to focus on using English which they usually didn't do.

Therefore, the generally favorable environment of the study afforded students opportunities and impetus to both learn and use English.

Heather: “Because this is a music movie and puts basketball sports and music together, so I think it is lets me relax, and feel very high in my mood so I like it. In the virtual world, I use the person. It’s the not real person in there. I use him to walk around this world. I think I can learn some information with English and I can talk to exchange the information to others.” SFH3

Annie: “For the virtual worlds, I’ve learned that the fastest way we get progress in our English is we chat in that world and just like we’re chatting in life. We don’t speak English a lot in school- but we chat a lot maybe about worlds or about our daily life. I think it’s useful for practice- not only vocabulary or words.” SFA3

3. What are student attitudes regarding the technical and social aspects of using virtual worlds in a conversation class setting?

In addition to the positive attitudes regarding computers and English motivation, and the favorable constructivist learning environment survey statements already reported in the aforementioned discussion, quantitative information from the student building reports indicated the increasing amount of time that students were willing to put into their final projects over the time span of the course. This culminated in a per-student average of 7.94 outside-of-class building hours for the week before the final project presentation.

There were a few surprising aspects regarding software usage that were not specifically designed into the current study, but which were of interest to the participants of the course. During the student interviews, three students revealed that thinking about and using the software itself motivated them not only think carefully about it and discuss it with their friends, but also learn English from it. While three different students expressed their feelings that using software or computers would not help their English, their interview answers and comments demonstrated passive influence of using the programs and the virtual system. They used terms such as “3D” or “downloading” and talked about visiting “virtual worlds” using “avatars”. They repeatedly mentioned software names such as “Flux Studio” and “Google SketchUp” and related how they

used the “Vircon” class website to get information. Whether the students were aware of it or not, they were using English language vocabulary and computer concepts.

They may have not been conscious of any learning going on, and this was not the research focus of the current study, but the students did notice the total English language atmosphere of the class. As mentioned in the previous section on results, most quantitative statements from all of the surveys indicated an overall positive learning experience and environment. This favorable environment was echoed in the words of all students in the student interviews. These students noticed and commented on the English language environment of the course, from using English language software, visiting real-world web sites, and following the step-by-step instructions of their teacher to reviewing written and video material on the class web page and discussing classmates’ virtual worlds on the virtual system. One student, who was not a fan of computers, even said that she wished more classes could be taught in this same way - where English was not just topic material, but an English language environment in which to learn and use the topic material.

Therefore, while students were not immediately able to independently perform every activity nor did they find value in every experience, most students found something in the course that they were good at and something in the environment that inspired them to perform.

Doug: “If I’m working and the manager asks me to do some report or presentation, I can use those programs to change the [image] to a .jpg file or .gif file - whatever.” SMD3

Annie: “It also makes me feel like I’m studying in America because English plays a different role there. Because the teacher uses English to teach our courses and if [teachers] use English to teach any other courses, we will also be interested in it. Just like studying in America- like studying in an English environment country.” SFA3

4. What are teacher perspectives and experiences regarding using virtual worlds and building tools toward motivating student interest in English?

There were no surveys or interviews for the teacher - only the teacher observation journal entries provided teacher perspectives and experiences. These entries showed that using virtual worlds and building tools toward motivating his students was a lot of work; far more than reading out of a textbook and even more than designing interesting topic material that he usually tried to provide his students in other classes. The journal entries indicated a roller coaster of teacher emotion, joy when the students could produce something, frustration when they had problems, and an underlying feeling of not being in total control. Due to the design of the study, he was not allowed to make changes to the pace of instruction or to the content of activities. In a normal class, if something wasn't working - he could modify it or even abandon it and take a totally new direction. In the current study, all he could do was try to be as clear, helpful and positive as possible. He felt grateful that the overall system, hardware and software elements functioned as predicted and without incident, but he was often apprehensive and introspective outside of the classroom because of the many unknowns involved with the study. He didn't know if the students were using the chat system or not, he didn't know if students would be able to handle the rapid pace of learning new technologies, and he didn't know if his students would be willing or able to put together their final story projects. Fortunately, some of the students demonstrated enough interest in the class to keep him motivated enough to keep trying to motivate them. And, most of the students surprised him with their ability to use a complex system of software and information to produce interesting and individual virtual worlds.

Using virtual worlds and building tools toward motivating students interest in English is possible, but is not a foregone conclusion. It is not a panacea that can cure all of the woes of

English teaching. It requires a teacher who is interested in and dedicated to the topic of virtual world usage for learning purposes, and who is willing to take chances to experiment with new and unfamiliar ideas.

“I was surprised by the variety of worlds in terms of effort, design and presentation. The world building classes put in more work. In a traditional class only a couple of students really put in extra time to do a good job- most are satisfied with giving the very minimum. Here too there were worlds that showed a lack of care or effort- but they were the minority- not the majority” T10

After the course had finished, one of the students who had previously expressed a negative interest in using computers in class told me, “In the beginning I didn’t understand why you wanted us to use computers for our conversation class, now I do.” T12

4.6 Merged Summary of Results

Two important concepts of the current study that were introduced in Chapter 1 are motivation and constructivist learning. These concepts are examined using quantitative and qualitative findings from the study in order to provide a merged alternative summary of results, and to offer preparation for the final section containing the conclusions of the study,

According to Oxford and Shearin (1994), motivation is a desire to achieve the goal of learning the language, combined with positive attitudes and effortful behavior toward achieving that goal. In the context of the current study, virtual world building influenced the desire of students to learn English by providing them with an authentic environment in which to learn and practice English. Computer motivation survey statements indicated that students felt building and using virtual worlds gave them feelings of accomplishment, allowed them to use authentic English, and helped them learn faster. Survey and teacher observations described how students used software tools to create virtual story worlds, received instructional training in class and via the class web page, and participated in conversation activities all using the target language of English. Positive student attitudes included English motivation survey responses related to

enjoying English, trying hard to learn English, and thinking about the words and ideas learned in their class. Teacher observations and student building records showed the significant amount of time invested and the effortful behavior expended by students in order to conceive and create their virtual story worlds.

Table 15 illustrates these motivational aspects by using characteristics from Oxford and Shearin's definition of motivation and second language learning and providing both quantitative and qualitative findings of the study. Two letter codes for the quantitative results indicate which survey, or record they were taken from; CM – computer motivation survey, EM- English motivation survey, CE- constructivist learning environment survey, and BR- student building record. Qualitative findings are indicated by statements made by the participants in the study; T- for teacher observation or S- for student interview.

Table 15

Motivation Characteristics and Findings Matrix

Characteristic	Quantitative	Qualitative
Desire to learn language	EM- try to learn English	S- Then we discuss in English - sometimes in the class- how to make the virtual world.
	EM- absorbed in what is taught	S- I learned a lot. I learned a lot of vocabularies in Flux Studio and we can talk to each other like- in the MSN, but not the same.
Positive attitudes	EM- English is more interesting than other subjects	
	EM- enjoy learning English	S- You hit Ctrl + F5 - you can see the world. It's nice
	CM- feeling of accomplishment	S- It's kind of fun and interesting because I never have done that before.
Effortful behavior	EM- learning English is great	T- I was surprised by the variety of worlds in terms of effort, design and presentation.
	BR- Week 9, 7.94 hours (ave.)	S- the fastest way we get progress in our English is we chat in that world
	CE- carry out investigations to test own ideas	S- Because of the background, colors, his billboards, and his sounds make me know he spent a lot of time to do it
	CE- discuss with other students how to conduct investigations	

Virtual world building, according to Jonassen's (n.d.) characteristics of meaningful constructivist learning, provided the environment which encouraged students to use constructivist learning strategies. The constructivist learning environment in the current study was: active- students didn't just learn about virtual world building, they built their own virtual worlds; constructive- they not only literally constructed worlds, but also constructed their own interpretations of the stories which guided their world building activities; collaborative- students worked with others in order to complete their building and conversation tasks; intentional- they specifically and intentionally accomplished the task of creating a virtual world about a story of their own choosing; complex- the students had to use several sophisticated software tools in order to complete their final building world task which was neither simplistic nor effortless; contextual- students didn't just memorize dialogues or vocabulary, rather they solved the authentic problem of creating a virtual story world in a conversation class setting; conversational- besides literally participating in conversations and discussions, students received numerous viewpoints and opinions from classmates and their teacher which encouraged them to explore multiple methods of sensory presentation; and reflective- students were encouraged to discuss with others and reflect on elements of their story worlds, and to use these insights to create informative and persuasive virtual worlds.

Table 16 illustrates characteristics of meaningful constructivist learning and provides both quantitative and qualitative findings of the study. Quantitative survey statement codes (CM, EM, CE) and qualitative participant statement codes (T or S) are the same as those used for the previous matrix regarding language motivation.

Table 16

Constructivist Learning Environment and Findings Matrix

Characteristic	Quantitative	Qualitative
Active	EM- English more interesting EM- English important part of school program	S- We can walk around in virtual worlds- like sightseeing S- Talking and playing with the virtual world at the same time
Constructive	CE- answers by investigation CE- test my own ideas	S- We use software- for example like, Flux Studio and PhotoFiltre to make the virtual worlds S- I made a house with another program – Google SketchUp
Collaborative	CE- discuss with other students CE- explain their ideas with me	S- We're always asking questions in class- how to use this or that S- We can ask a friend in the computer, how you like my world, or what's the feedback about my world
Intentional	CE- gives me more control CE- presents data in meaningful ways	S- Before I describe the world, I understand what the characters are doing and what happens in the story S- You can put anything you want to- like characters, animals, anything models, buildings, trees, bridge
Complex	CE- is complex but clear CE- is challenging to use	S- We open the file and then put images to the Flux Studio S- We use PhotoFiltre to make the pictures different
Contextual	CE- presents realistic tasks CM- use authentic English CE- shows complex real-life environments	S- Software is in English, can learn vocabulary S- It's like studying in an English environment country S- The teacher taught us step-by-step to use this software
Conversational	CM- more chances to practice English EM- think about words CE- talk to other students	S- We have to describe the things we have seen, and that can improve my English speaking. S- We go to virtual world and chat about oceans or forest
Reflective	CE- think deeply about new ideas CE- think about own understandings	S-.I don't know everything, but a little- about pictures and billboards- I can teach my friends T- They are understanding that the project is integrated- not a lot of discrete lessons, but one important world that they must understand and build

4.7 Overall Summary of Results and Discussion

Overall, quantitative measures indicated that the virtual building and conversation activities of the current study gave students a sense of accomplishment, provided them with a highly collaborative environment and allowed them to think deeply about their educational tasks. Student interviews showed the tasks and activities, for the most part, to be motivating and interesting and able to engage the imaginations of the students. Surprisingly, operation of the software and usage of the class web site was reported to add to the authentic English language atmosphere of the course. The teacher perceived the course activities to motivate students more than traditional conversation class activities did, but required a greater expenditure of time and energy by both students and teacher.

