

Rochester Institute of Technology

RIT Digital Institutional Repository

Theses

2004

Delivering a graphic design course online: simulating a real classroom situation and speculating what technologies can ideally offer in this virtual situation

Uttam Kokil

Follow this and additional works at: <https://repository.rit.edu/theses>

Recommended Citation

Kokil, Uttam, "Delivering a graphic design course online: simulating a real classroom situation and speculating what technologies can ideally offer in this virtual situation" (2004). Thesis. Rochester Institute of Technology. Accessed from

This Thesis is brought to you for free and open access by the RIT Libraries. For more information, please contact repository@rit.edu.

ROCHESTER INSTITUTE OF TECHNOLOGY

Thesis submitted to the Faculty
of the College of Imaging Arts and Sciences
in candidacy for the degree of Master of Fine Arts.

“Delivering a graphic design course online: simulating a
real classroom situation and speculating what technologies
can ideally offer in this virtual situation.”

by
UTTAM KOKIL

August 2004

Thesis Committee Approval

Chief Advisor:

Jim Ver Hague, Professor,
Computer Graphics Design

Jim Ver Hague

Signature of Chief Advisor

8/20/04
Date

Associate Advisor:

Chris Jackson, Assistant Professor,
Computer Graphics Design

Chris Jackson

Signature of Associate Advisor

Date

Associate Advisor:

Chin Loo Lama, Adjunct Faculty,
Information Technology

Chin Loo Lama

Signature of Associate Advisor

8/17/04
Date

School of Design Approval

Chairperson:

Patti Lachance, Associate Professor,
School of Design

Patti Lachance

Signature of Chairperson, School of Design

8-30-04
Date

I, UTTAM KOKIL, hereby (grant, ~~deny~~) permission to the
Wallace Memorial Library of RIT to reproduce my thesis in whole or part.
Any reproduction will not be for commercial use or profit.

Aug 20, 2004
Date

TABLE OF CONTENTS

Acknowledgements	i
Abstract	1
Introduction	2
Literature Review	3
Process	6
Technical Considerations	13
Results and Discussions	18
Analysis	20
Conclusions	21
Recommendations	22
Appendix I	23
Appendix II	32
Appendix III	34
References	37

ACKNOWLEDGEMENTS

While working on my M.F.A (Computer Graphics Design) thesis, I have been assisted by many people to whom I wish to express my sincere gratitude. This project has been a success with the collaboration of various resource persons. First, I am thankful to the International Institute of Education, NY, that has granted me a Fulbright scholarship to pursue my MFA at Rochester Institute of Technology, and in particular, Ms Jenny Wilson, the program officer, who has been advising me ever since my arrival in the U.S. Moreover, I appreciated the assistance of my Thesis Advisors, Professor Jim Ver Hague, Professor Chris Jackson, and Ms Chin Loo Lama. During the course of this project, Professor Jim Ver Hague was the most supportive and accessible supervisor. And, without the encouragement of Chin Loo and constructive criticisms of Professor Chris Jackson, this project would not have attained its summit. Furthermore, I am extremely grateful to Professor Jason Arena who voluntarily helped me overcome problems that I encountered with the Flash Communication Server, from time to time. I would like to thank all faculty who collaborated with me in accessing their online courses and all the students who participated in the initial testing of this project. A word of thanks goes to Jon Fahnestock, my fellow classmate, who helped me infinitely troubleshoot Flash MX ActionScripts problems. Finally, I dedicate this project to my wife and to my daughter, Perna for all their support and love.

ABSTRACT

This thesis examines a new way to simplify online education and to simulate a real classroom situation. It explores how a graphic design class can be conducted online where the students from different geographical locations and faculty can interact instantaneously with the aid of video, chat and whiteboard. For the most part, the potential for Macromedia Flash Communication Server to deliver chat, whiteboard and video functionality are assessed. It is speculated that video images are slightly jerky among Modem users whereas sharp video images are obtained with high-speed Internet connection. The survey findings among the design students and faculty at R.I.T reveal the following: 75% agreed that the project can be Functional; 68% esteem the Esthetic value of the web site and 48% are in favor of its Usability features. The whole project is executed in Flash MX 2004, making use of User Interface Components and Communication Components.

Keywords:

Flash Communication Server, Chat, Whiteboard, Video, Macromedia, e-learning, UI Components, Communication Components, Simulation.

INTRODUCTION

Technology can be used to enhance the curriculum, facilitate communication between instructor and students and enhance the learning process as well. The students and instructor are separated from each other by location and by time in an online learning situation. Online education can be organized into three different categories: asynchronous, synchronous and hybrid classes. This project fully focuses on the synchronous mode of delivery. This implies that communication between the students and the instructor is instantaneous and more importantly, feedback can be obtained on the spot, just like in a classroom situation.

Paulo Freire, in *Pedagogy of Oppressed* (1993), describes our current learning system as “Education thus becomes an act of depositing, in which the students are the depositories and the teacher is the depositor.” This implies that instead of communicating, the teacher issues communiqués and make deposits that the students patiently receive, memorize, and repeat. Moreover, cutting edge technology can be used to enhance the delivery of online courses, facilitate communication between students and instructor, and ultimately enhance the learning process. Regardless of the type of technology used, the seven principles for good practice in undergraduate teaching (Chickering, 1987) should be adhered to. To paraphrase these principles, good teaching encourages contacts between students and faculty, develops reciprocity and cooperation among students, uses active learning techniques, gives prompt feedback, emphasizes time on task, communicates high expectations, and respects diverse talents and ways of learning. For the most part, in a classroom situation, the faculty have developed methods for fulfilling these principles. However, when a course is implemented online, the physical separation of the instructor and learner can create obstacles to achieving the seven principles mentioned above. This is where technology can help bridge the gap and provide instructors with the tools to maintain the principles in the online classroom. (Barbay, C. & Doo, I., 2004).

New online interactive technologies are enabling a shift from a teaching-centered paradigm to what Barr and Tagg(1995) refer to as a learning-centered paradigm that includes:

- i) An emphasis on discovering and constructing knowledge rather than transferring knowledge from the teacher to the student.
- ii) An emphasis on active students rather than on active faculty.
- iii) The support of multiple learning styles.
- iv) A shift from faculty members as lecturers to faculty members as designers of learning environments.

- v) The conceptualization of learning as a co-operative and collaborative activity rather than one that is individualistic and competitive.

This new model is highly interactive such that besides the use of live videos, chat and whiteboard as primary tools, it also immerses the user into a virtual environment similar to a physical world. The tools have analogies based on the physical world. Through analogy, the student can learn to use the interface fully. One is familiar with a whiteboard found in a classroom for instance, and the interface makes it easier for the student to understand its function and usage. In addition, through demonstration using live videos, the students feel closer to a traditional classroom environment.

Thus, to further enrich the classroom approach, this model makes use of the Chat for instantaneous communication. The aim is not to learn a new technology but rather to concentrate on the course materials. The tools are easy to understand and an overview session may be useful so that the user may gain some basic knowledge on how to handle the tools.

LITERATURE REVIEW

Research demonstrates that both low and average level achievers earn higher scores on standardized achievement tests and aptitude tests when taught through their learning styles preferences (Dunn, Griggs, Olson, Gormon, Beasley, 1995). At the same time, we need to take into account the fact that no single learning preference is better than any other. Students become more competent learners if they can have preferences for more than one single learning style. This makes them more versatile learners. For instance, underachievers tend to have poor auditory memory. They learn better through graphics and animations rather than texts (Dunn, 1998).

Using the web as only a new kind of delivery medium for educational materials does not add significant value to the learning and teaching process. The integration of technology in learning needs to address the important issue of enhancing the teaching and learning process, rather than just being seen as a new delivery medium.

The Discussions page of this project focuses on three main interactivities: chat, where the user can convey his/her thoughts through texts; live videos, where the user feels closer to the real world; whiteboard, where the user has the ability to upload and show images to everybody who is connected online, in the virtual class. The layout has been simplified, labeled and the tools are easy to adapt. In

this way, the user does not have to focus on the technicalities; rather one can devote one's time on the course being taught.

Multimedia and, recently, virtual reality have brought new interaction modalities and more scenarios for the delivery of information. Synchronous learning has a much higher level of impact; its members experience a learning need and undertake discussions in a more fundamental way from the forum. A solid project begins with research and planning. Some brainstorming sessions paved my way to design the most appropriate solution that incorporates both esthetics and functionality.

The process started with a flowchart, the main reference of my thesis. After reviewing the web sites of several online learning institutions in the U.S, I proposed different layouts and information architecture. The color schemes were not decided at this stage. The project had to be brought to life; aspects such as image, functionality, usability, security, and efficiency were taken into consideration. The dilemma was about which platform to choose, PC or MAC. I had to make sure that the project works on cross platform, and moreover, whether it should have been a Director MX based project or Flash MX or a combination of both. In addition, I came across some important links from the Macromedia web site that featured how Flash MX has been accurately developed for e-business and e-learning. This was an extremely crucial hint in the beginning stage. I closely went through various tutorials from the same web site, especially those related to the Flash Communication Server. Finally I decided to embark on this project using Macromedia Flash MX, as the deliverable was to be on the Web. I had two choices in mind, either to simulate the whole thesis project in a Flash MX environment or to really tackle the technological aspects so as to make it functional. Definitely, those Macromedia tutorials were a deep source of inspiration for me and with the assistance of my Chief Thesis Advisor, I developed a great deal of self-confidence.

Tutorials such as drawing line segments using pen and pencil tools were primarily performed and tested in Flash MX, before being uploaded to the Flash Communication Server. The Flash online forums are excellent resources for help. I posted all my doubts and queries for clarification on these online forums frequently. Ultimately, I established amicable links with the online users in the sense that my queries were never left unanswered. At the same time, this online forum was an indication of how my project would function once on the Web. This is because in order to send messages on these forums, one has to make use of the Chat feature, similar to a situation where a student communicating to other classmates online.

For the most part, the literature survey consisted of conference papers from ICOOL, an international conference on e-learning held at the University of Mauritius in Dec. 2003. The conference was timely in the sense that I was collecting raw data during that same period. When I went through each paper, one keyword struck me all the time – “interactivity.” Most of the papers revealed a lack of interactivity between students and tutor, especially when dealing with online courses. They mentioned ways by which traditional distance education could be improved by adding interactivity, since the new technology was omnipresent. Most international institutions have switched from conventional distance education mode of mailing materials to online learning, thereby making use of the World Wide Web. Evidently, this added technology stimulates the students to be more focused in their respective courses. By contrast, they will no longer be sitting in front of static and motionless websites.

Nevertheless, basic parameters such as Internet speed connection, hardware and software cost have to be taken into consideration to make this project feasible, especially to the Third World countries. The Internet-Magazine speculates that there will be 150 million web sites in a decade. The digital divide is an economic problem, such that computers are too expensive for the low-income group. Without doubt, there remains the issue of usability divide as well. Thus, various elements like layout, information hierarchy, color schemes and navigations in the interface design should be carefully executed for ease of use to the end users.

Some Faculty members who were conducting online learning courses at R.I.T were consulted and permission was granted to access their courses. The existing online platforms used at R.I.T, First Class and myCourses respectively, were compared. Improvements were made in terms of GUI (graphical user interface) including color schemes, navigations and giving the users more flexibility and options to use this new platform with added features. The existing online platforms are basically more static and disorganized the way information is presented. Each existing online web site was analyzed individually and a list of items was noted such as features, navigations, color schemes, information architecture, and whether the icons utilized were globally understood.

PROCESS

(i) Flowchart

The flowchart served as a guide and the starting point for the whole layout and concept of the web-site. In the beginning, the flowchart was depicted as shown below, refer to *diagram 1*.

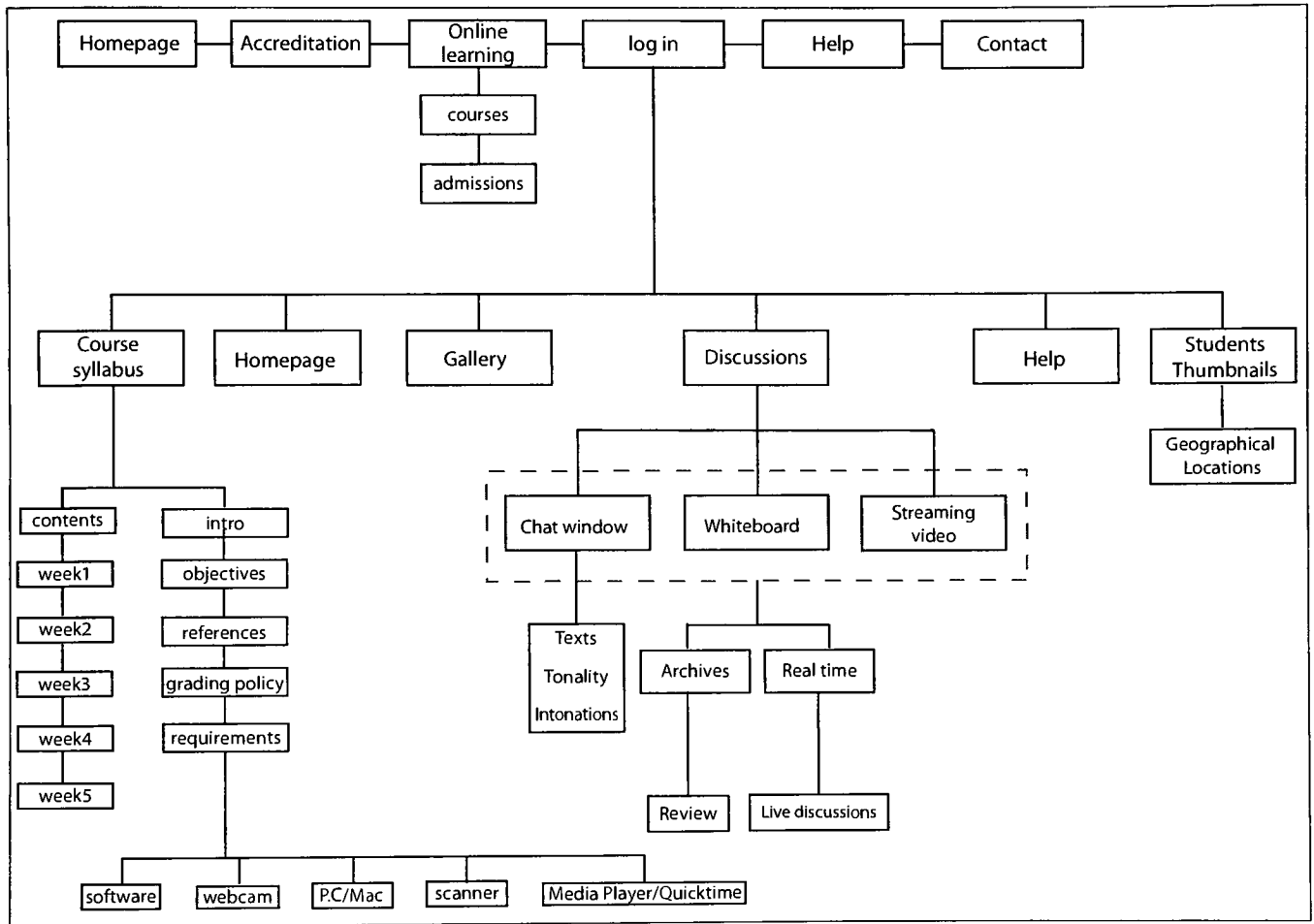


diagram 1

Ultimately, the whole structure was slightly modified as shown below, refer to *diagram 2*. This indeed rendered navigation more fluid in the sense that the main Menus and Sub-Menus were more organized, hence a better hierarchy was achieved.

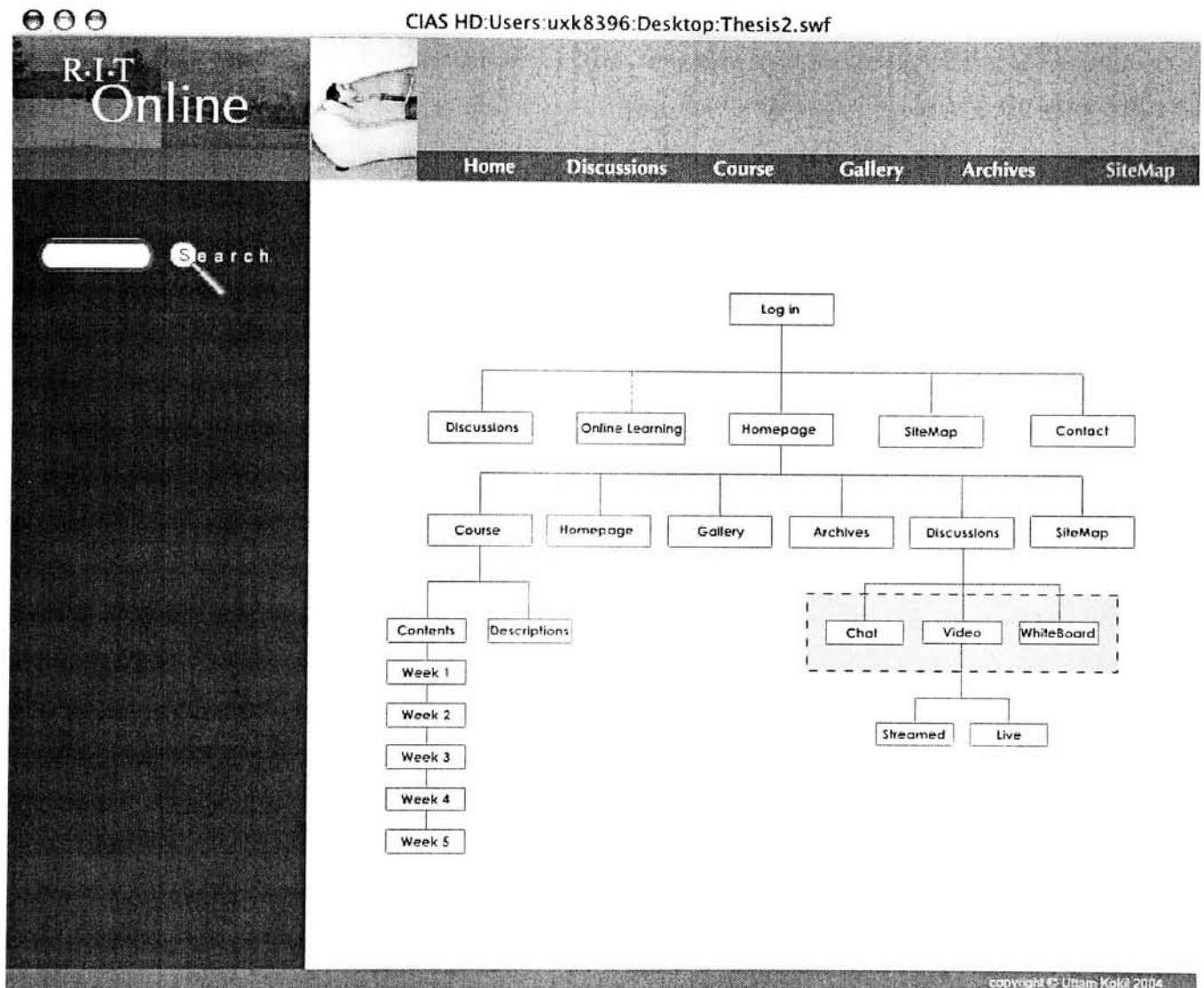


diagram 2

(ii) Discussions page

Next, the “Discussions page” was tackled, as it was the most important part of the project. The preliminary layout is as shown below, refer to *diagram 3*.

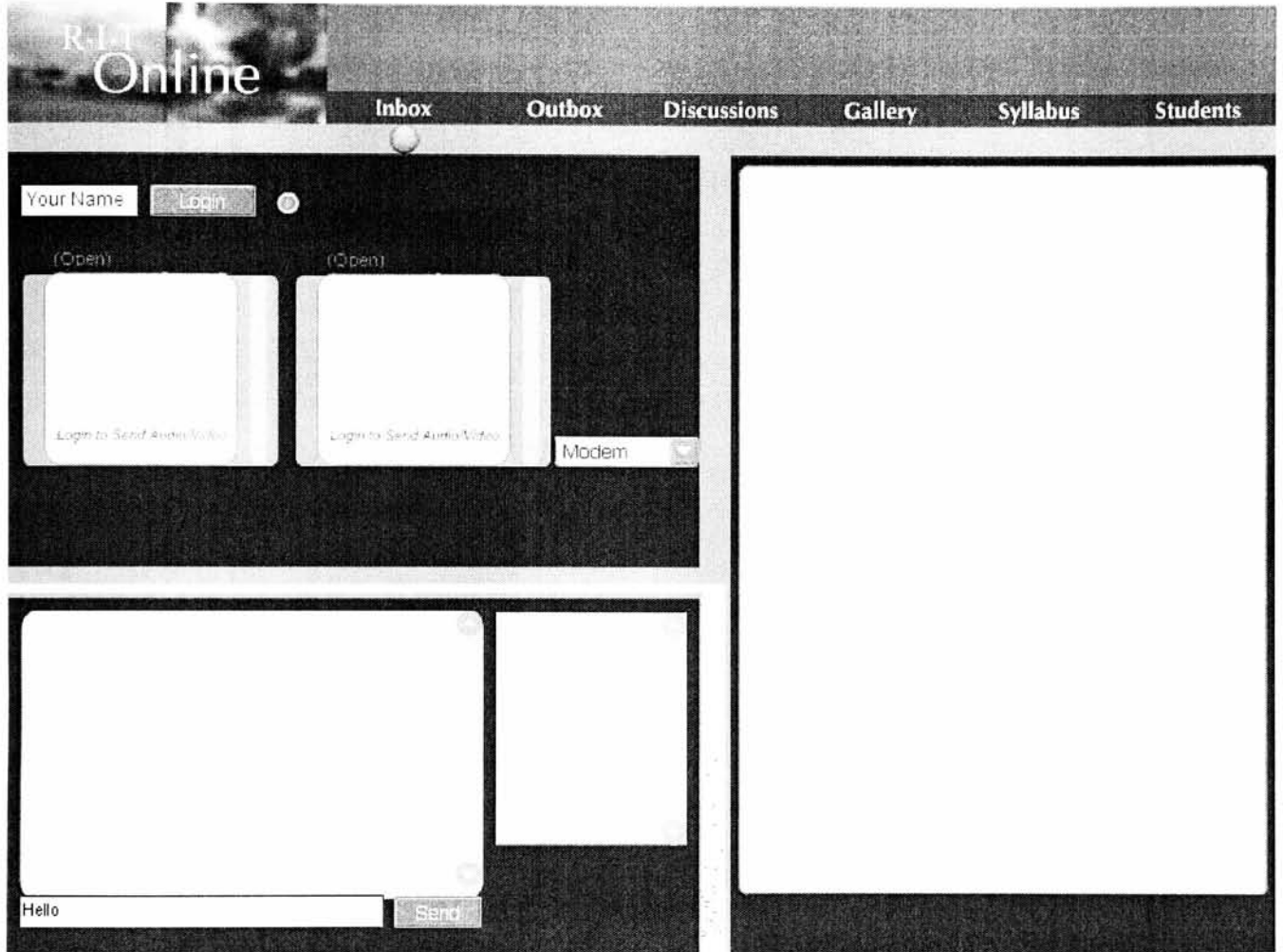


diagram 3

Major considerations were taken in the above structure and modified after meeting with my Thesis Advisors in terms of background color, size, proportion and placement of each individual element. The latter needed to follow a grid system, so as to obtain a more accurate positioning within the page. Even the thick lines separating each tool needed to be blended with the background color; the latter was found to be too brilliant as well. Subsequently, more elements were to be added on that same page like artwork thumbnails, and audio device. All the interactive tools were placed on the same page for ease of use.

Finally, the "Discussions page" was revamped as a whole after the inclusion of several elements, as shown in *diagram 4* below.

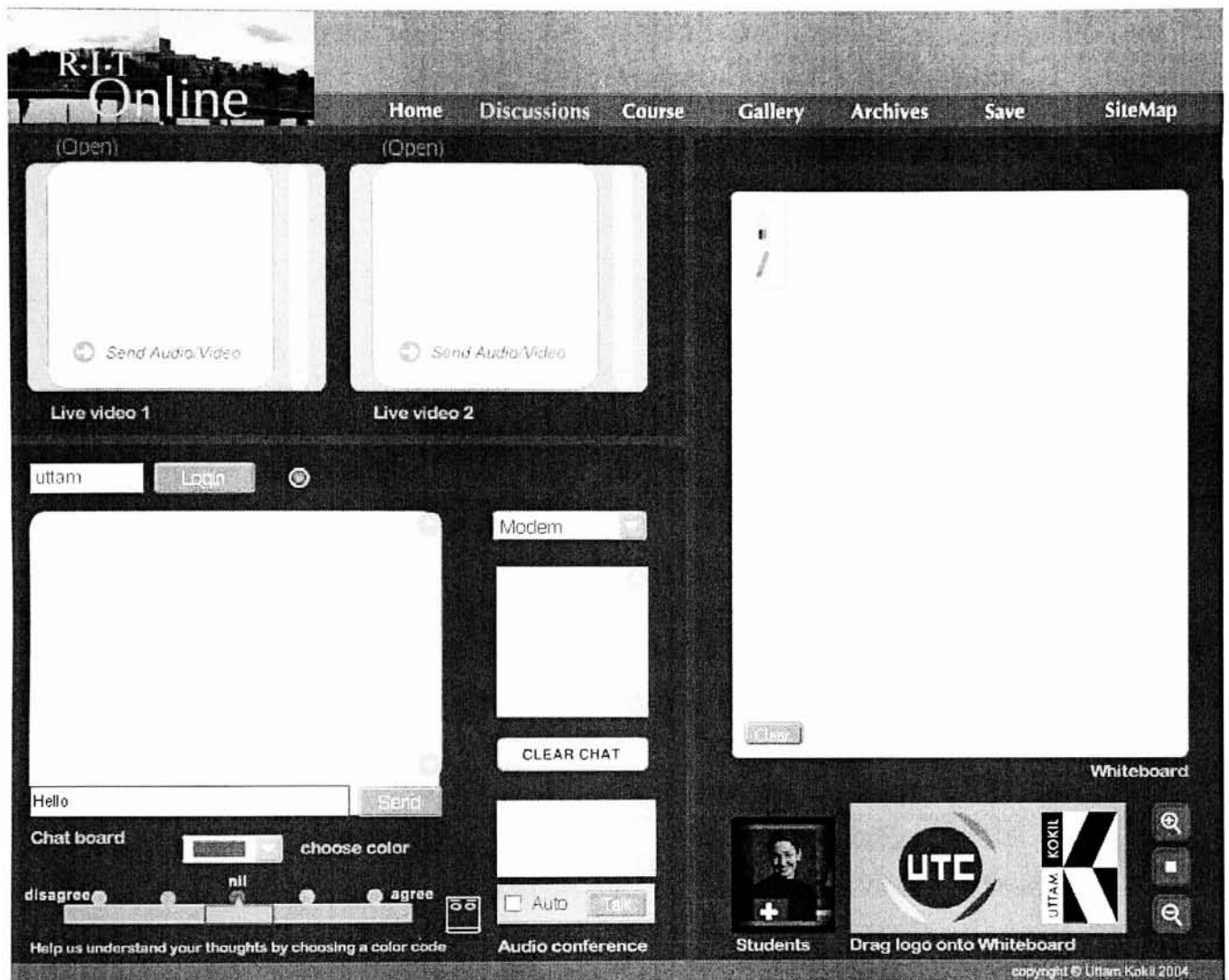


diagram 4

The alterations made are as follows:

- The sliding menu has been removed so that it has the same type of navigation throughout.
- The whiteboard has been re-sized to accommodate the revolving menu of the students who are connected online, the zoom-in, zoom-out and reset tools, the area to upload students' artworks.
- The pen and pencil icons have been included in the whiteboard as the mouse turned into either one of the tool when clicked.

- (d) A scale of agreeability to disagreeability reflecting the level of agreement that the student has in a class critique situation or any other topics being discussed.
- (e) On the scale, each level of agreement is denoted visually by a particular graphic.
- (f) A drop down menu containing a set of several colors has been added whereby the user may choose the appropriate color for the text in the Chat, depending on the level of agreeability.
- (g) The “Clear Chat” button deletes any text messages in the Chat board.
- (h) An audio talk device used to communicate across the server; the user needs to press the audio button while engaged in a talk with other users.
- (i) A revolving menu that contains the picture Identity of all the users who are connected online. However, those who are virtually absent from the class have been represented by a grey silhouette instead.

Development of the Whiteboard:

The codings for both, the pencil and pen tools were worked out in Macromedia Flash MX using actionscripts. Each tool was then exported as SWF and tested separately for functionality.

Refer to *diagram 5* for a preliminary idea to draw with the pencil tool and *diagram 6* to draw with the pen tool respectively.

Each interactive element has an analogy to a real class situation. Components from Flash MX 2004 were utilized for the Chat and Videos. In order to log in, there are the Modem or LAN options. Better clarity in terms of video images and faster communication for the Chat and Whiteboard were obtained when switching from Modem to LAN, in the drop down menu.

A major enhancement to this project is to view the picture of each user who is connected online across the globe. As soon as one is connected online, irrespective of the geographical location, his/her picture appears in the moving menu; and if a student is offline, only a grey silhouette is seen.

The Whiteboard is primarily a place where the students' works can be uploaded so that everyone who is connected online can see and thus provide suggestions for improvement. Furthermore, it contains the basic tools, the pen and the pencil with which one may draw or sketch onto the whiteboard. The pen draws straight-line segments whereas with the pencil tool, one can draw irregular lines. The artwork such as the logo may be dragged onto the whiteboard and may be re-sized using the zoom-in and zoom-out tools.

One has to log in first using one's first name in the Discussions page. Consequently, the cursor turns into an arrow tool as soon as the user is logged in the website, and even his/her name is indicated. This in fact gives other users a cue for all those who are connected online.

The Chat board is basically a platform used to type in text messages to communicate with other on-line users. A measure of agreement to disagreement has been included to this chat board such that the user has the flexibility to choose level of agreement as regards the topic being discussed or evaluated and different graphic is obtained for each level of agreement, a visual means of quick identification. Next, the user can also choose the appropriate color from the drop down menu, as reflected in the circular shapes of "agreement to disagreement" gauge. Ultimately, the text can be cleared from the chat board using the "Clear Chat" button.

The two live Videos and Chat board utilized in this project were derived from a tutorial based on the Flash Communication Server from the Macromedia website. A Sony TRV-17 model DV-web camera was connected via Firewire cable to the user's computer while the other web-camera was connected in the same way to the recipient's computer. The camera mode was selected in either case to view and communicate with each party live. As an enhancement, an audio feature was added. The user has to press on the talk button while speaking via a microphone, connected to the DV camera.

The pencil tool

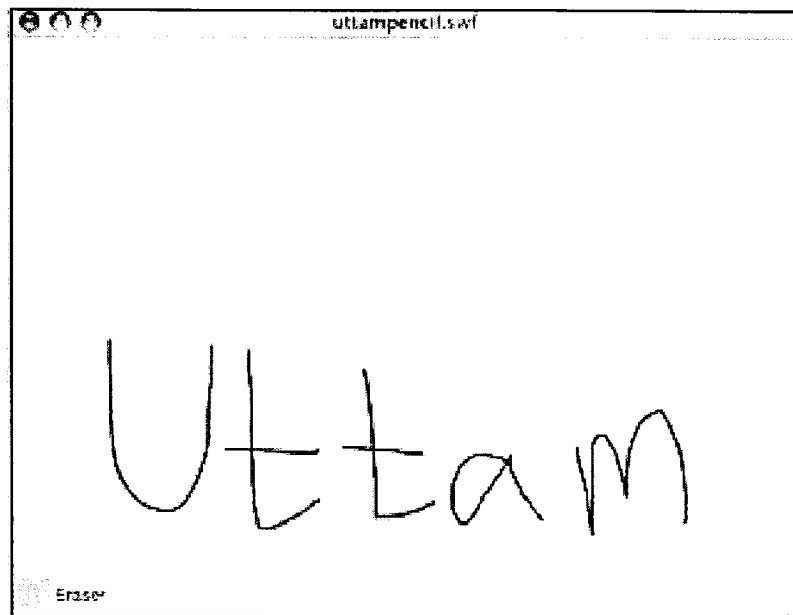


diagram 5

The pen tool

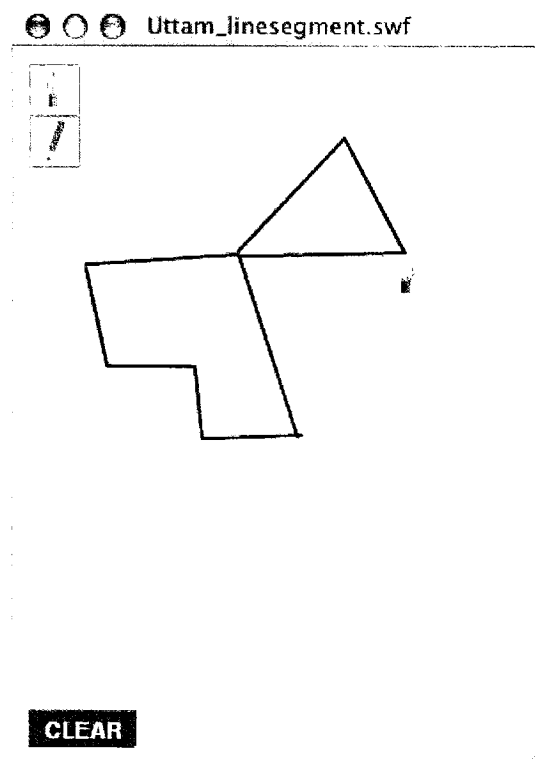


diagram 6

TECHNICAL CONSIDERATIONS

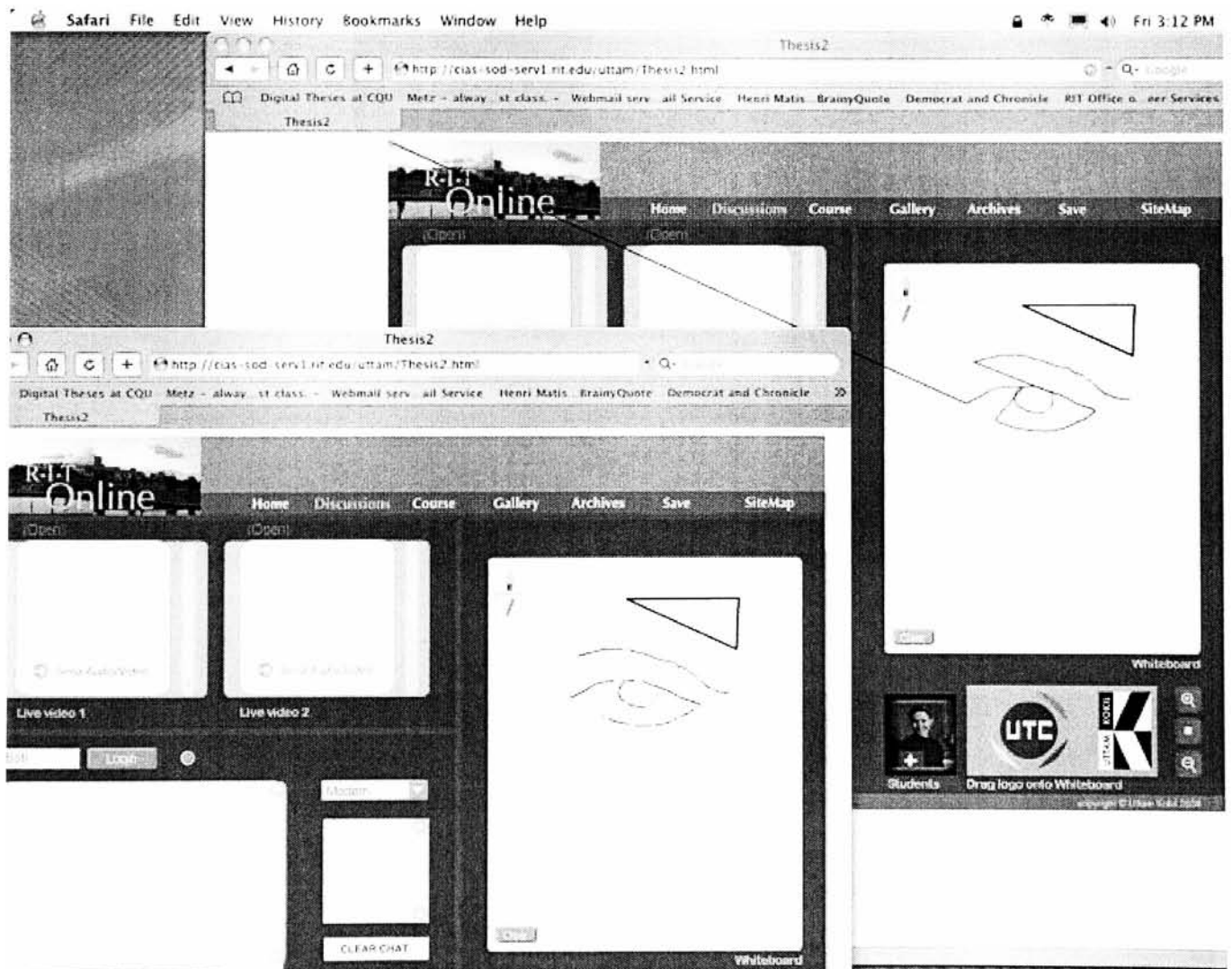
A) RELATED TO SERVER SIDE

Test A:

- 1) Draw with pen tool
- 2) Draw with pencil tool

Results: On the same page itself: it works.

Opening another page from the browser: a line starting from the origin connects to where the pencil tool starts drawing.

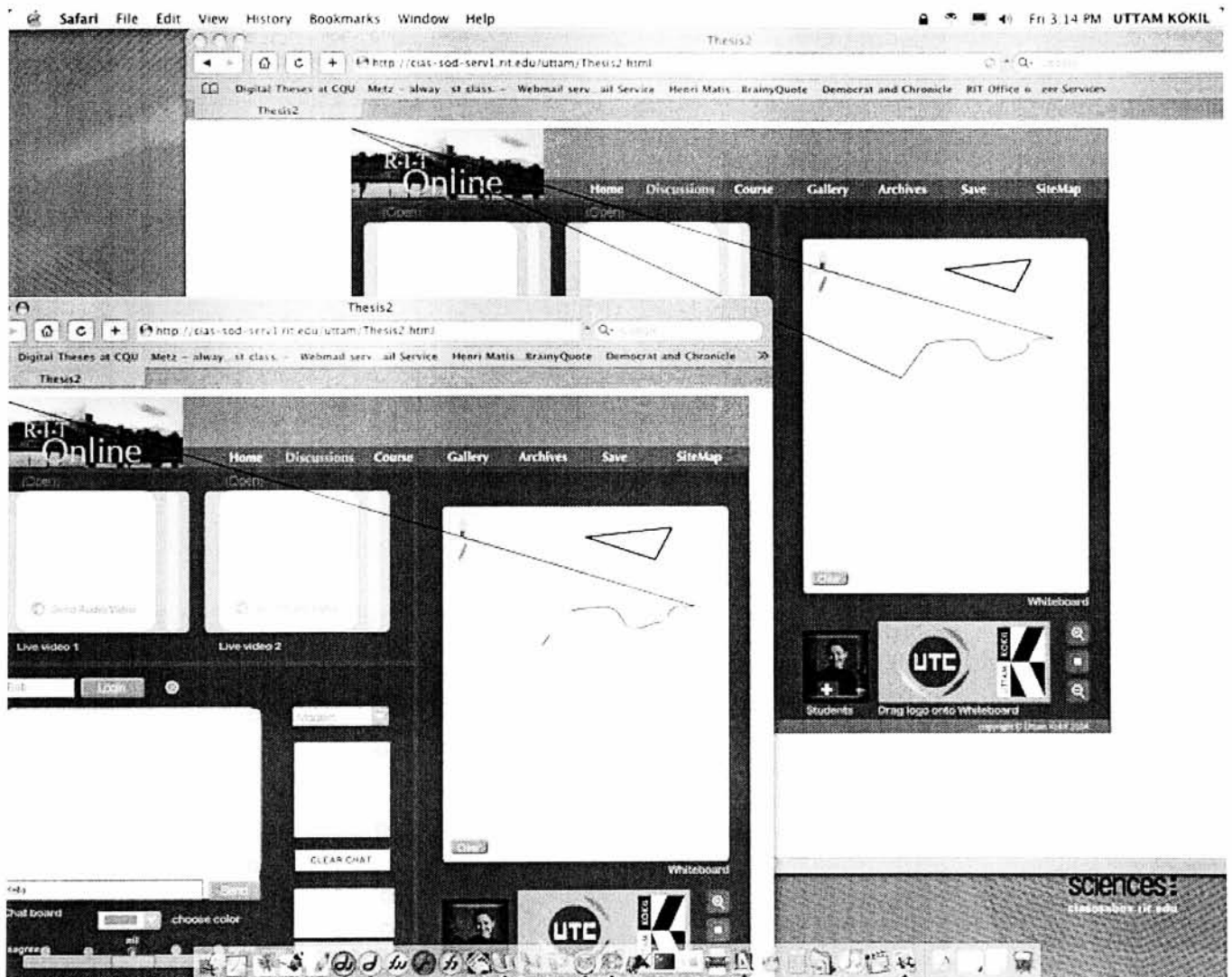


Test B:

- 1) Draw with pencil tool
- 2) Draw with pen tool

Results: As soon as the pencil is clicked on the same page, it draws the freehand line properly.

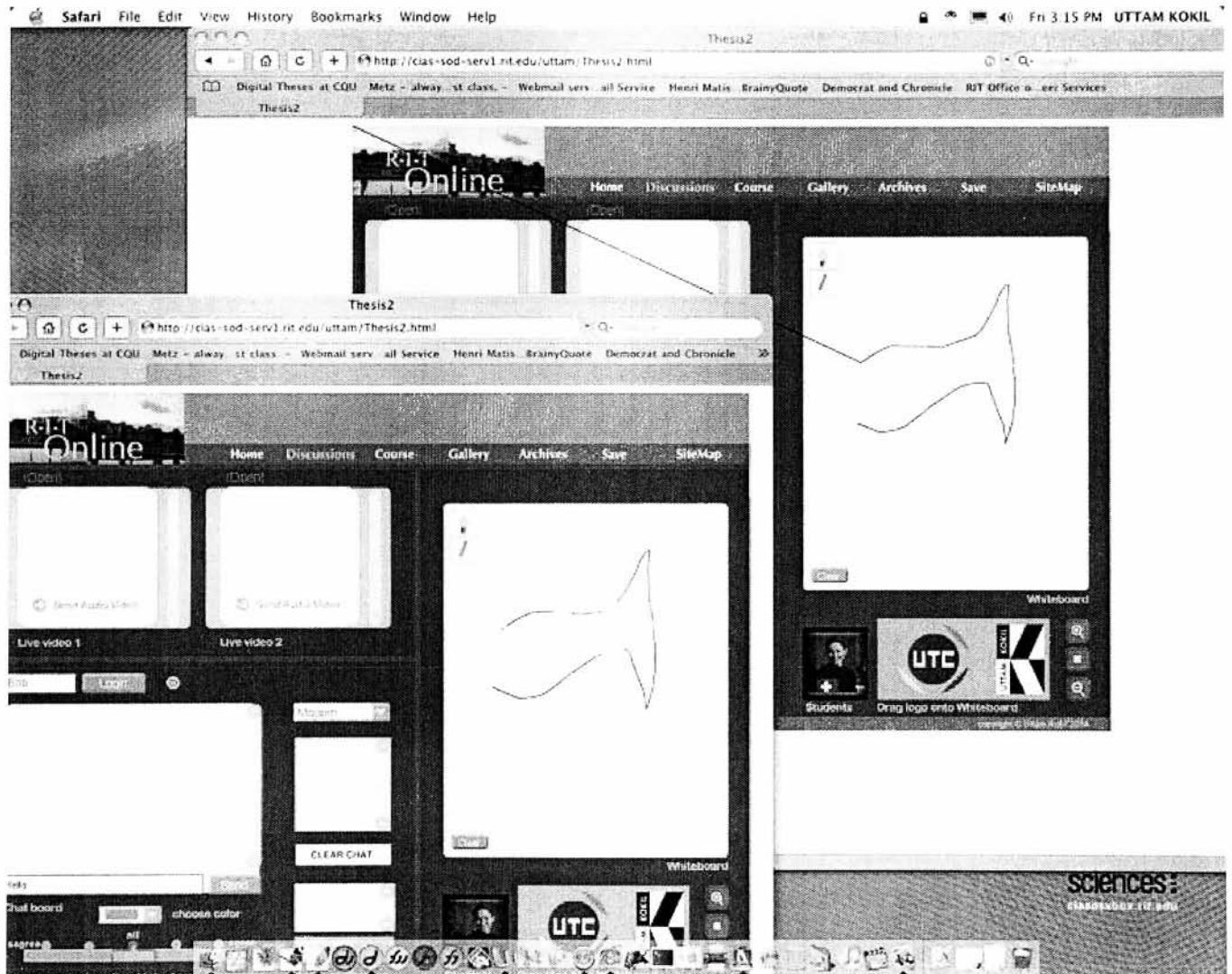
Opening another page from the browser: a straight line originating from (0,0) connects the starting point of the pencil drawing.



Test C:

1) Draw with pencil tool only

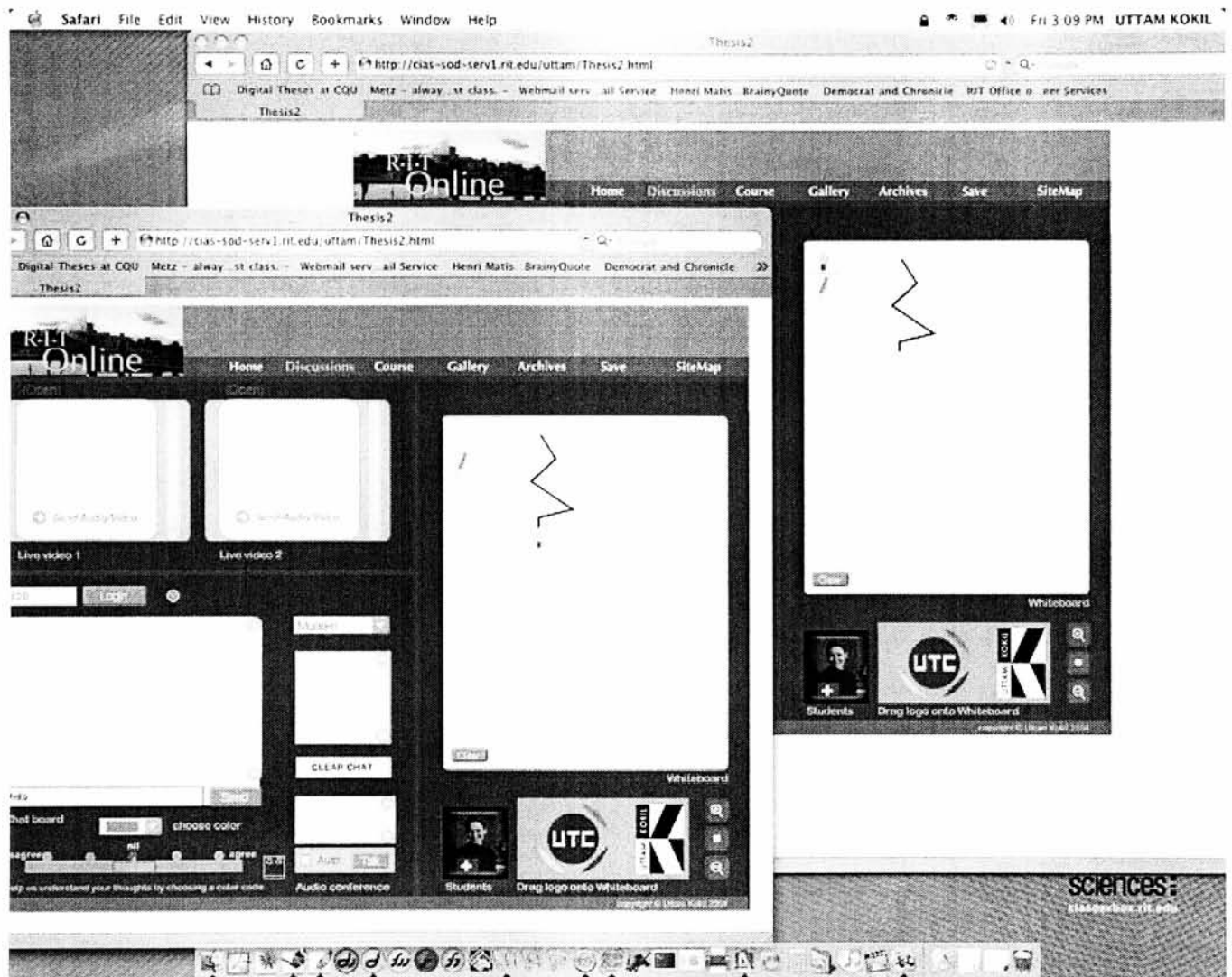
Results: When drawing solely with the pencil tool, on my page, it works properly, however, on the second page, a straight line appears from the origin and every time I click the pencil to draw, a straight line joining the last point to the new point is seen.



Test D:

1) Drawing with the pen only:

Results: The exact drawing is obtained, with no extraneous lines.



It is noted that the pen and pencil tools of the whiteboard function properly when exported as SWF file but the above problems are encountered when the thesis2 fla file is published and uploaded to the Flash Communication Server.

B) VIDEO.FLV FILE

The video.flv file would not play when the start button was clicked.

In the HTML doc file sites, see *diagram 7* below, after connecting to the remote host server, the video.flv file should be selected and then uploaded (clicking on put files) to the the server.

Only the Thesis2.swf and Thesis2.html files were being selected and uploaded to the server.

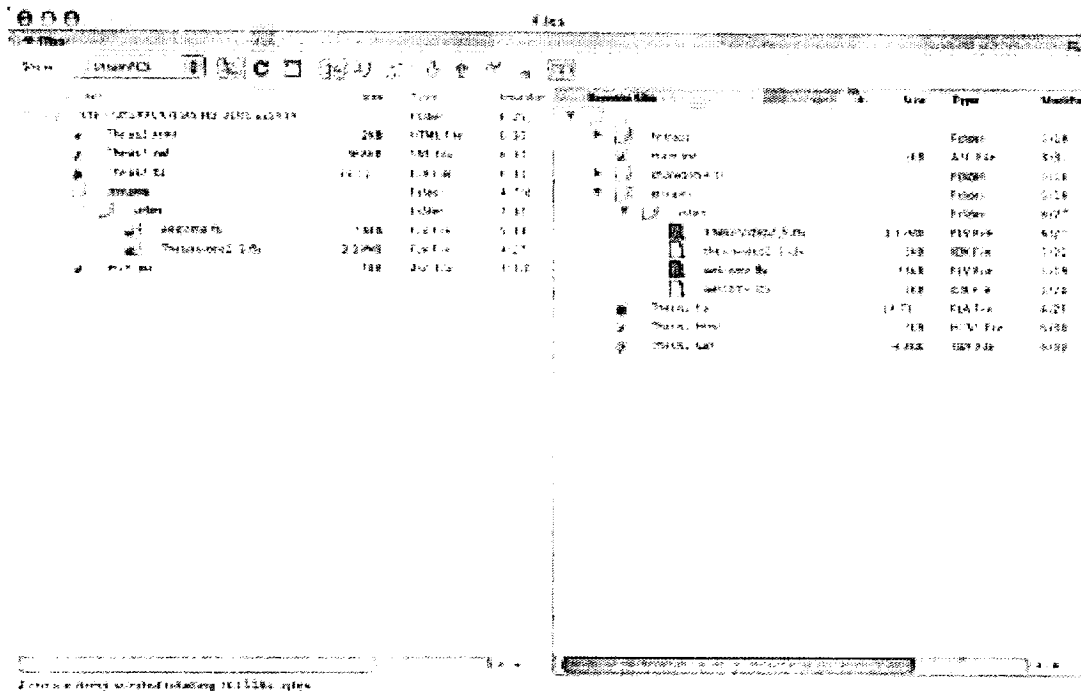


diagram 7

C) PROBLEMS ENCOUNTERED WITH COMPONENTS

Components are not included in Flash MX. This project was started in Flash MX and the Communication and the UI Components were downloaded from the Macromedia website. Later I switched from Flash MX to Flash MX 2004 and ultimately to Flash MX 2004 Pro version. There were incompatibility issues with previous version components (for e.g. ComboBox and TextInput Components) in newer the version of Flash MX 2004. The components were invisible when the flash file was exported as SWF and uploaded to the remote server.

After considerable testings, I made use of the newer UI components and got rid of the older ones. Then only the Flash movie worked properly on the Flash Communication Server.

RESULTS & DISCUSSIONS

Simply putting content in front of a learner is not education; instead it requires activity, work and application. Pedagogy is more important than technology. The value of any technology is found only in how it adds value to educational objectives. Technology merely acts as a facilitator.

Online learning has several advantages. First, one has the flexibility to study where and when one chooses. Secondly, one can contact the teacher outside the class, anytime. Moreover, group synergy encourages healthy learning to take place. There is more participation in group discussions. Students can add and access materials at their own conveniences. And hence, learning becomes more interactive with immediate feedback.

However, there are time zone differences where certain students will never be able to participate with other students if they are logged in when the instructor is asleep. Let us consider someone from the Far East and another student from the U.S or Canada taking the same course where there is a time difference of 9-12 hours.

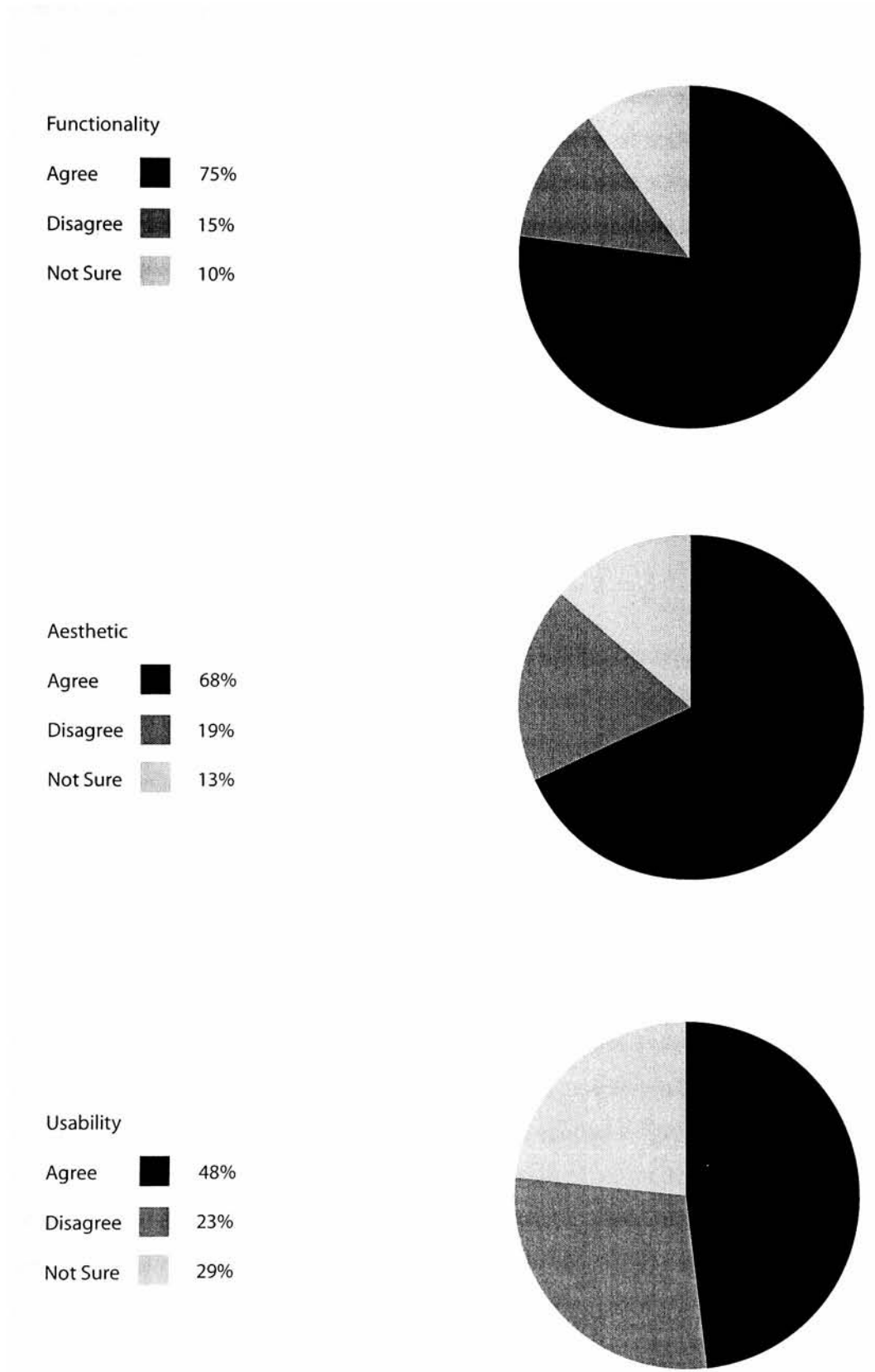
Nonetheless, the live video option in this project simulates (substitutes/replaces) the human face-to-face contact. Online learning offers students the opportunity to work at their own pace. Consequently, students do not have to be located physically near the education center. Resources for the subject matter are not limited to those available locally. The Internet provides resources that are up to date and varied.

The feedback received from the usability test was valuable. When asked how the project could be made more interactive, it was pointed out a notice board was required where the students and tutors might post general information or respond to questions. Another feature that could give an added value is “annotation”. This allows the staff and students to add comments to particular parts of the web page. The teacher can modify the annotation or move it to a more appropriate area. In addition, materials can be easily accessed and updated on the World Wide Web.

The video conferencing concept is appropriate since it enables conversational interaction with other students and the instructor that enriches the learning environment. Moreover, the whiteboard and video in combination enable the students and the teacher to see and discuss each other’s work and share in the feedback interactively, just like in a class critique.

From the survey, it was pointed out that the contact info for each student was missing. The contact info should appear in a small box whenever the scrolling picture (thumbnail) of the students is clicked. Moreover, with modem users, the performance of video option may slow down. Also, the color codings in the chat appealed to most of the audience. There was an interesting remark concerning the color scheme of the website; one respondent suggested that the use of gray tones for the website would make the important features stand out. Furthermore, the need for labelling each feature and component in the Discussions page arose because during the testing sessions, I found out that many students took some time to familiarize themselves with each feature. Some students found the whiteboard confusing because of the extraneous lines, a functional problem. A tool needed to be added to keep track of those who have been participating in online class sessions, however often, so that the instructor may use it to help grade the students. The student should also be able to download movies from the video lessons, store the text messages in the chat and save images that are deemed necessary from the whiteboard.

ANALYSIS



No solution is complete without testing. The usability testing is as critical as the initial design process. Every effort is made to ensure that the solution is user friendly, visually appealing and reliable. Evidently, after performing the usability tests, there were important refinements that deemed necessary in the project. The focus groups were mainly New Media, Graphic Design and Computer Graphics students from R.I.T. They provided realistic feedback. I observed some of them while they were performing the test and this aided me to understand the degree of complexity of some of the Web pages.

A survey was conducted to get a feedback on this thesis project at R.I.T. The number of participants was 25 and those who took part in that survey were mainly Instructors and Students in the design field. See questionnaire annexed in appendix. The question categories were mainly divided into three main aspects: **The Functionality**, **The Aesthetic** and **The Usability** of the project.

They were then divided into the following: **Agree**, **Disagree**, **Not Sure** for the analysis. As shown above in the Pie Chart, 75% of the respondents agreed that the project is fully functional, according to the aims of the project. 68% gave a positive note on its aesthetic value and 48% responded positively as regards to its usability.

CONCLUSIONS

Education is a priority in every individual's life in order to climb the ladder of success. Nowadays, advanced technology and research are making this possible via online learning. This is a conceivable project of how to shrink the World into a global village. Online Learning is already present but there some new features with added value in this project that can give the learner an impetus to achieve his/her goal. An important component of online learning is the development of self-directed learners. This would imply that students should understand 'how people learn' as well as being fluent with the technology. Furthermore, this is a viable project because it can connect both P.C and Mac users through the Live Video, Chat and Whiteboard. This kind of interactive project demands a huge amount of programming work and thanks to Macromedia, one can always make use of "components" to achieve the desired results.

RECOMMENDATIONS

This project can be further exploited by jointly working with a Macromedia Developer since the server side scriptings are well advanced. Thus the technical issues can be resolved and more emphasis can be laid on the user interface design and interactivity part. Moreover, the graphic design course can be dispensed in several other languages like Spanish, French or Korean due to the large number of students enrollment. The course quality itself is enhanced with a variety of students originating from across the globe, having diverse cultural background.

APPENDIX I: Project Actionscripts

Actionscripts for the pencil tool:

```
init();
stop();
function init() {
    initDrawing();
    initMouse();
}
// it creates an empty movie clip called draw_mc to contain the drawing
function initDrawing() {
    createEmptyMovieClip("draw_mc", 100);
    draw_mc.lineStyle(2, 0x000000);
    createEmptyMovieClip("temp_mc", 200);
}
//A listener object is an object that receives notification from an event
//when that event is triggered in a movie.
function initMouse() {
    mouseMoveListener = new Object();
    mouseMoveListener.onMouseMove = function() {
        mouseMoveEvent();
    };
    mouseClickListener = new Object();
    mouseClickListener.onMouseDown = function() {
        mouseDownEvent();
    };
    mouseClickListener.onMouseUp = function() {
        mouseUpEvent();
    };
    Mouse.addListener(mouseClickListener);
}
//Every mouse button press triggers the mouseDownEvent() function.
//The moveTo method sets the position for a line to the mouse's current x and y position.
```

```

//The following code adds the mouse move listener so that anytime you move
//the mouse while pressing the button you trigger another drawing event.
function mouseDownEvent() {
    draw_mc.moveTo(_xmouse, _ymouse);
    Mouse.addListener(mouseMoveListener);
}

//Releasing the mouse button erases the green dot with the clear() method on temp_mc.
//This code also removes mouseMoveListener, stopping the drawing.

function mouseUpEvent() {
    temp_mc.clear();
    Mouse.removeListener(mouseMoveListener);
}

function mouseMoveEvent() {
    // Remove any previous drawing
    temp_mc.clear();
    // Draw dot at End Point
    temp_mc.lineStyle(6, 0x00ff00);
    temp_mc.moveTo(_xmouse, _ymouse);
    temp_mc.lineTo(_xmouse+0.5, _ymouse+0.5);
    // Draw line segment
    draw_mc.lineTo(_xmouse, _ymouse);
}

// Click on eraser button to delete any pencil line drawing
eraser_btn.onPress = function() {
    draw_mc.removeMovieclip();
    initDrawing();
};

```

Actionscripts for both pen and pencil tools combined:

```
//codings for pen tool
```

```
StartPenX = pen_mc._x;
```

```
StartPenY = pen_mc._y;
```

```
init();
```

```
stop();
```

```
function init() {
```

```
    initDrawing();
```

```
    initMouse();
```

```
    showPen = true;
```

```
    showPencil = true;
```

```
}
```

```
container = "none";
```

```
function initDrawing() {
```

```
    createEmptyMovieClip("draw_mc", -100);
```

```
    draw_mc.lineStyle(2, 0x000000);
```

```
    createEmptyMovieClip("temp_mc", -200);
```

```
}
```

```
function initMouse() {
```

```
    mouseMoveListener = new Object();
```

```
    mouseMoveListener.onMouseMove = function() {
```

```
        //using a variable here
```

```
        if (container == "pen") {
```

```
            mouseMoveEvent();
```

```
        }
```

```
    };
```

```

mouseClickListener = new Object();
mouseClickListener.onMouseDown = function() {
    if (container == "pen") {
        mouseDownEvent();
    }
};
mouseClickListener.onMouseUp = function() {
    if (container == "pen") {
        mouseUpEvent();
    }
};
Mouse.addListener(mouseClickListener);
}

```

```

function mouseDownEvent() {
    startX = _xmouse;
    startY = _ymouse;
    Mouse.addListener(mouseMoveListener);
}

```

```

function mouseUpEvent() {
    draw_mc.moveTo(startX, startY);
    draw_mc.lineTo(_xmouse, _ymouse);
    temp_mc.clear();
    Mouse.removeListener(mouseMoveListener);
}

```

```

function mouseMoveEvent() {
    // Remove any previous drawing
    temp_mc.clear();
    // Draw line
    temp_mc.lineStyle(1, 0x0000ff);
    temp_mc.moveTo(startX, startY);

```

```

temp_mc.lineTo(_xmouse, _ymouse);
// Draw dot at End Point
temp_mc.lineStyle(6, 0x00ff00);
temp_mc.lineTo(_xmouse+0.5, _ymouse);
// Draw dot at Start Point
temp_mc.moveTo(startX, startY);
temp_mc.lineTo(startX+0.5, startY);
}

this.onEnterFrame = function() {
    if (container == "pen") {
        pen_mc._x = _xmouse;
        pen_mc._y = _ymouse;
        Mouse.hide();
    }
    if (container == "pencil") {
        pencil_mc._x = _xmouse;
        pencil_mc._y = _ymouse;
        Mouse.hide();
    }
    if (_root.pen_mc.hitTest(eraser_btn)) {
        pen_mc._visible = false;
        Mouse.show();
        showPen = false;
    } else if (showPen == false) {
        pen_mc._visible = true;
        Mouse.hide();
    }
}

eraser_btn.onPress = function() {
    draw_mc.removeMovieClip();
    draw1_mc.removeMovieClip();
    initDrawing();
    initDrawing1();
};

```



```

        if (_root.pencil_mc.hitTest(eraser_btn)) {
            pencil_mc._visible = false;
            Mouse.show();
            showPencil = false;
        } else if (showPencil == false) {
            pencil_mc._visible = true;
            Mouse.hide();
        }
    };

    pen_mc.onRelease = function() {
        container = "pen";
        pencil_mc._x = StartPencilX;
        pencil_mc._y = StartPencilY;
    };

    //codings for pencil tool
    StartPencilX = pencil_mc._x;
    StartPencilY = pencil_mc._y;
    init1();
    stop();
    function init1() {
        initDrawing1();
        initMouse1();
    }

    // it creates an empty movie clip called draw_mc to contain the drawing
    container = "none";
    function initDrawing1() {
        createEmptyMovieClip("draw1_mc", -101);
        draw1_mc.lineStyle(2, 0x000000);
        createEmptyMovieClip("temp1_mc", -201);
    }

```

//A listener object is an object that receives notification from an event when that event is triggered in a movie.

```
function initMouse1() {  
    mouseMoveListener1 = new Object();  
    mouseMoveListener1.onMouseMove = function() {  
        if (container == "pencil") {  
            mouseMoveEvent1();  
        }  
    };  
    mouseClickListener1 = new Object();  
    mouseClickListener1.onMouseDown = function() {  
        if (container == "pencil") {  
            mouseDownEvent1();  
        }  
    };  
    mouseClickListener1.onMouseUp = function() {  
        if (container == "pencil") {  
            mouseUpEvent1();  
        }  
    };  
    Mouse.addListener(mouseClickListener1);  
}  
  
// Every mouse button press triggers the mouseDownEvent1() function. The moveTo method sets the position for a line  
// to the mouse's current x and y position.  
  
// The following code adds the mouse move listener so that anytime you move the mouse while pressing the button you  
// trigger another drawing event  
  
function mouseDownEvent1() {  
    draw1_mc.moveTo(_xmouse, _ymouse);  
    Mouse.addListener(mouseMoveListener1);  
}  
  
//Releasing the mouse button erases the green dot with the clear() method on temp_mc  
//This code also remove mouseMoveListener1, stopping the drawing  
  
function mouseUpEvent1() {  
    temp1_mc.clear();  
    Mouse.removeListener(mouseMoveListener1);
```

```

}

function mouseMoveEvent1() {
    // Remove any previous drawing
    temp1_mc.clear();
    // Draw dot at End Point
    temp1_mc.lineStyle(6, 0x00ff00);
    temp1_mc.moveTo(_xmouse, _ymouse);
    temp1_mc.lineTo(_xmouse+0.5, _ymouse+0.5);
    // Draw line segment
    draw1_mc.lineTo(_xmouse, _ymouse);
}

pencil_mc.onRelease = function() {
    container = "pencil";
    pen_mc._x = StartPenX;
    pen_mc._y = StartPenY;
};

```

Actionscripts for sharedObject for the Pen Tool (Flash Communication Server):

```

function initSharedObject() {
    main_nc = new NetConnection();
    main_nc.onStatus = function(info) {
        if (info.code == "NetConnection.Connect.Success") {
            drawing_so = SharedObject.getRemote("drawing", main_nc.uri, false);
            drawing_so.onSync = function(list) {

                for (var n in list) {
                    var line_obj = this.data[list[n].name];
                    draw_mc.moveTo(line_obj.x1, line_obj.y1);
                    draw_mc.lineTo(line_obj.x2, line_obj.y2);
                }
            }
        }
    }
}

```

```

}

        };

        drawing_so.connect(main_nc);
    } else {
        trace("ERROR: "+info.code);
    }
};

main_nc.connect("rtmp:/uttam");
}

```

// Referring to the codings of the Pen Tool above, these following modifications have been made in the mouseUpEvent:

```

function mouseUpEvent() {
    var line_obj = new Object();
    line_obj.x1 = startX;
    line_obj.y1 = startY;
    line_obj.x2 = _xmouse;
    line_obj.y2 = _ymouse;
    var slot = "line_"+startX+"-"+startY+"X"+_xmouse+"-"+_ymouse;
    drawing_so.data[slot] = line_obj;
    temp_mc.clear();
    Mouse.removeListener(mouseMoveListener);
}

```

APPENDIX II: Procedures to connect to the Flash Communication Server

The flash file (**Thesis2.fla**) is published as HTML and SWF in Flash MX 2004 Professional;
The settings used are:

Flash Player ver 6.0

ActionScript ver 2.0

Using Dreamweaver MX (or any other text editor), a text file called main.asc is created.

The main.asc file only needs to contain the following line of code:

```
load( "components.asc" );
```

The main.asc file is saved. This file tells the server to load all the server-side code for the Communication Components when the application starts.

In addition, the path of the flv file (**ThesisVideo2_5.flv**) for the streaming video is as follows:

streams/video/ThesisVideo2_5.flv

Create new a folder called "uttam" that will ultimately contain the following files:

streams folder/video folder/ThesisVideo2_5.flv

Thesis2.fla

Thesis2.html

Thesis2.swf

main.asc

Open Macromedia Dreamweaver MX 2004, and go to the Menu Site/Manage sites to create a new site called "uttamFCS"; the local info and the remote info are defined.

For the local info, the following is entered in the field:

site name: uttamFCS

Local Root Folder: CIAS HD:Users:uxk8396:uttam:

click O.K

For the Remote info, the following is entered in the field:

Access: FTP

FTP host: cias-sod-serv1.rit.edu

Login: *****

Password: *****

check box: Use passive FTP

click O.K

Next go to Window/Files (F8) to open the palette containing both the Local and Remote files.

Select the following files to be uploaded to the Flash Communication Server from the Remote Folder:

Thesis2.swf

Thesis2.html

ThesisVideo2_5.flv

Click on the icon that connects to the remote host and click on the upward arrow icon to put the files. They are thus uploaded to the FCS. Open a browser and type the following url to go to the link to the directory:

<http://cias-sod-serv1.rit.edu/uttam/Thesis2.html>

APPENDIX III: Project Evaluation Instrument

Thesis Title:

**“Delivering a graphic design course online; simulating a real classroom situation
and speculating what technologies can ideally offer in this virtual situation”** by Uttam KOKIL

M.F.A (Computer Graphics Design), Rochester Institute of Technology, NY 14623

Part 1

a) E-mail (optional)-----☐

b) Major/Occupation: -----☐

c) Gender:

Male ☐

Female ☐

d) Age group:

Less than 20 ☐

20-25 ☐

26-30 ☐

31-35 ☐

35 above ☐

e) Are you a PC / MAC user?

PC ☐

MAC ☐

Both ☐

None ☐

f) Please describe your experience with web browsers (internet)?

Beginner ☐

Intermediate ☐

Advanced ☐

Not at all ☐

g) What is your connection speed?

Modem 56k ☐

Cable /DSL ☐

LAN ☐

Part 2

Open your favorite browser. Type the following url:

<http://cias-sod-serv1.rit.edu/uttam/Thesis2.html>

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
1) Do you think navigating throughout the website was easy enough?					
2) Do the labels on each button give you a cue about what you will see in the respective pages?					
3) In the Discussions page, do you understand the concept of incorporating the following interactive tools?					
(i) Chat					
(ii) Whiteboard					
(iii) Video					
4) Do you feel incorporating a CHAT feature really enhances interactivity?					
5) Do you feel incorporating a WHITEBOARD feature really enhances interactivity?					
6) Do you feel incorporating a LIVE VIDEO feature really enhances interactivity?					
7) Do you think allowing the user to pick up a color of his/her choice in the CHAT, depending on his/her level of agreement or disagreement to an idea makes it closer to a real classroom critiques situation?					
8) Do you think the color scheme is appropriate to this type of educational website?					
9) Do you think that the texts are legible?					
10) Do you think that the graphics/images used in each page substantiate the concept respectively?					
11) Do you think the website is visually attractive and appealing?					

	Strongly agree	Agree	Not sure	Disagree	Strongly disagree
12) Do you think this website should have been more flashy in look (animation and sound) and styles?					
13) Do you think the website looks sophisticated enough in terms of esthetic quality?					
14) Do you think the intro page is appealing enough to capture your attention?					
15) Do you think the homepage gives you an overall idea about the rest of the website?					
16) Do you think the same quality of education can be imparted or obtained using Online delivery/learning mode for a corporate design course, especially when live video, chat and whiteboard are incorporated?					
17) Do you think the idea of delivering a graphic design course online is new?					
18) Do you think this idea of delivering a graphic design course online is feasible with modern technology?					
19) Do you think the design of this website gives a feel about online learning, especially that of a design subject?					
20) Do you think the design of this site is appropriate to its target audience?					
21) Do you think the idea of showing the pictures of those who are connected online is superfluous?					

22) How would you make this project more interactive?

-----□

-----□

-----□

23) Please feel free to add any comments below.

-----□

-----□

REFERENCES

- (1) Annual International Distance Education Conference, 11th. 2004. A&M Texas University, (2004).
Using Digital Video Conferencing an Other Web-Based Technology to Enhance Online Learning.
Barbay, C. & Doo, I. Texas.
- 2) Chickering, A. & Gamson, Z. (1987). ***Seven Principles for Good Practice in Undergraduate Education: American Association for Higher Education Bulletin.*** Washington Center News.
- 3) Garrett, J.J. (2002). ***The Elements of User Experience: User-Centered Design for the Web.***
(1st Ed). Indiana. New Riders and Pearson education.
- (4) International Conference on Open and Online Learning, 1st. 2003. University of Mauritius, (2003).
Effectiveness of blended learning at UOM: The case of the VCILT. Submitter 140. Mauritius.
- (5) International Conference on Computers in Education, 7th.1999. Chiba. (2003). ***Highly Interactive Distance Learning for the Future.*** G.Cumming at al. (eds). Japan.
- (6) Franklin, D. (2002) ***Macromedia Flash MX ActionScripting: Advanced Training from the Source.***
Macromedia Press.
- (7) Towes, K. (2002). ***Macromedia Flash Communication Server MX.*** Pearson Education and
Macromedia Press.
- 8) <http://www.Flashcomguru.com>
- 9) <http://www.actionscripts.org>
- 10) <http://www.macromedia.com>
- 11) <http://www.ultrashock.com>
- 12) <http://www.flashcfm.com>