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Designing and Implementing a User Interface for ReCourse

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by

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1 Abstract

The goal of this IQP was to develop and evaluate a new user interface for an online course management program called ReCourse. This was be carried out in three main phases – research, development, and testing. The first phase, research, is documented in section four of this document. The second phase uses the information gathered in phase one to create a user interface that is both pleasing and effective. The third phase utilizes standard user interface evaluation methodologies to compare the old interface with the new interface.

2 Executive Summary

Background:

ReCourse is an online course management system developed at WPI though many projects. It has had several interfaces; however these interfaces were more of an afterthought. They were developed as small parts of large projects, and therefore little time was spent on their design. The toolbars were too large and looked unprofessional. This project focuses on designing a new interface for ReCourse that is functional and visually appealing.

Methodology:

After completing research into user-interface design, it was necessary to use the information gathered to design a pleasing user interface. The first interface designed consisted of five possible color schemes, each utilizing two different colors. This interface was then subjected to usability testing which showed that the five color schemes were not sufficient. Most web pages would not match these colors, giving the entire site an unprofessional appearance. The interface was then redesigned to allow the professor for a particular course to select two colors out of 40 available colors. This results in 1600 possible color schemes, which makes it easy to select pleasing colors for a course's web page.

Results:

The final interface was subjected to the same usability test as the preliminary interface. Results show that the shortcomings of the preliminary interface (bad colors, unprofessional appearance) were fixed in the final interface.

Conclusion:

This project succeeded in developing a pleasing and usable interface for ReCourse. Both professors and students agree that the new interface is much better than the old one. This interface has not yet been used in a classroom environment, but will be used in the summer of 2000 and beyond.

3 Introduction

ReCourse is an online course management program. The current interface is less than ideal. ReCourse is currently used by professors at WPI and will soon be used by a teacher at a Framingham high school. These professors and students will greatly benefit from an improved interface. Also, a better interface may encourage more professors to use ReCourse in their classes. Figures 1-3 show the current toolbars.

Figure 1

Figure 2

Figure 3

As can be seen, both the student and instructor toolbars occupy a significant amount of space. This is undesirable because it limits the amount of space that can be used for content. Also, the images used for the toolbar were downloaded from various sites on the Internet and do not have a consistent appearance. This leads to an unprofessional appearance. The focus of ReCourse is upon the content and the interface should reflect this. While the toolbar should be well designed, it should not be dominant.

The interface developed as a result of this IQP should be both aesthetically pleasing and functional. It should be easy to locate elements on the toolbar and difficult to make errors.

4 Background

4.1 Recourse

ReCourse is an online system used for course management. It enables students and professors to track grades and assignments online and also facilitates communication between students and professors. It consists of two main interfaces, student and instructor.

4.1.1 Student Interface

The student interface contains:

- Home page
- Chat page
- Search
- Grades
- Site Map
- Bulletin Board
- Online Quiz
- Change Password
- Class List
- Help

4.1.2 Instructor Interface

The instructor interface contains:

- Home Page
- Links
- Site Map
- Chat
- Search
- Global Replace
- Toolbars
- Users
- Grades
- Bulletin Board
- Quiz Generation

- Site Composer
- Password
- File Upload
- Email Class
- Group Mail
- Help

4.2 Web Based User Interface Design

There are many concepts that should be taken into consideration when designing a user interface for use on the Web. Colors, icons, menus, layouts, and consistency are all very important in creating an effective user interface. Unfortunately, all users have different opinions regarding what makes an interface appealing and it is impossible to create one that satisfies all users. Therefore, it is necessary to rely on the results of previous studies to determine what colors, fonts, etc. will be pleasing to the majority of users.

4.2.1 Colors

An appropriate choice of colors can give a professional look to an otherwise uninteresting interface. Color can draw attention to components, soothe the user, emphasize information, warn the user, or elicit emotional reactions. While color can have a positive effect on a user interface, care must be taken to avoid overusing or misusing color. Here are several guidelines for successful use of color in user interfaces [Shneiderman, 1998]:

- Use color conservatively
- Limit the number of colors
- Recognize the power of color as a coding technique
- Ensure that color coding supports the task
- Have color coding appear with minimal user effort
- Place color coding under user control
- Design for monochrome first

- Consider the needs of color-deficient users
- Use color to help in formatting
- Be consistent in color coding
- Be alert to common expectations about color codes
- Be alert to problems with color pairings
- Use color changes to indicate status changes
- Use color in graphic displays for greater information density

While not all of these guidelines are relevant when designing a user interface for the web, several are crucial. The web is full of pages with atrocious color schemes. The designer must ensure that the colors are pleasing to users and imporove the web page. Also, the designer should never assume that the user has access to a color display and therefore must test the design in grayscale before deploying the interface.

Another issue is that some colors are "browser-safe". There are 216 such colors. Use of other colors can result in unpredictable results in different browsers and on different platforms.

4.2.2 Icons

Text and icons are interchangeable in many circumstances. The particular application determines the more appropriate choice. When designing icons, several guidelines should be followed [Shneiderman, 1998]:

- Represent the object or action in a familiar and recognizable manner.
- Limit the number of different icons.

- Make the icon stand out from its background.
- Consider three-dimensional icons; they are eye catching, but also can be distracting.
- Ensure that a single selected icon is clearly visible when surrounded by unselected icons.
- Make each icon distinctive from every other icon.
- Ensure the harmoniousness of each icon as a member of a family of icons.
- Design the movement animation
- Add detailed information, such as shading, thickness, color, or animation.
- Explore the use of combinations of icons to create new objects or actions.

These are the four levels of icon design [Marces, 1992]:

- Lexical qualities – pixel shape, color, brightness, blinking
- Syntactics – lines, patterns, modular parts, size, shape
- Semantics – concrete versus abstract, part versus whole
- Pragmatics – legible, utility, identifiable, memorable, pleasing

Shneiderman suggests that a fifth level may be Dynamics: highlighting, dragging, combining, etc.

4.2.3 Menus

Menus are important because they allow users to access information stored in the web site. There are many styles of menus that can be used and it is important to realize that the order of the items on a menu is not something to take lightly.

Menu Structures

- Single – A single menu
- Linear – A linear sequence of menus
- Tree – Each menu can lead to several other menus, but no two menus lead to the same menu.
- Acyclic – Similar to the Tree structure but several menus can lead to the same menu.
- Cyclic – Similar to the Acyclic structure but menus can lead back to menus at higher points in the tree.

Menu Item Orders

There are several common orderings for menu items – alphabetic, related items together, frequent items first, and important items first.

According to a study detailed by Card [Card, 1982], users located commands more quickly when the menu items were presented alphabetically. Here are the results from the study:

Strategy	Time per trial (seconds)
Alphabetic	0.81
Functional	1.28
Random	3.23

It is important to note that while alphabetic ordering generally results in users locating commands quickly, it may not always be the most appropriate choice. Random ordering is obviously not desirable but functional ordering does have an advantage in situations in which commands can be grouped easily and some commands are used much more frequently that others.

4.2.4 Layouts

Layouts for web pages differ from layouts in most applications. Users of web pages have come to expect a fairly standard interface with a menu or icons either on the top or left hand side, and the content opposing it. It is also common to place this menu in a separate frame from the content so that menu items do not change from page to page.

4.2.5 Consistency

An important concept in interface design is consistency. Pages in a web site should maintain a common appearance. This includes color schemes, icons, menus, and layouts. Terminology should also be consistent – similar actions should be named similarly, i.e. "Add Student" and "Add Grade", not "New Student", and "Add Grade". The user should not have to learn several different interfaces.

4.3 User Interface Evaluation

4.3.1 Expert-Review Methods

Expert-Review methods are commonly used in the professional world to evaluate user interfaces. There are several common methods used, although it is not necessary to utilize all the methods – just a few.

Heuristic Evaluation

Expert reviewers use a short list of design heuristics to evaluate an interface. One common list of heuristics is known as "The Eight Golden Rules" [Shneiderman, 1998].

The Eight Golden Rules

1. Strive for consistency
2. Enable frequent users to use shortcuts
3. Offer informative feedback
4. Design dialogs to yield closure
5. Offer error prevention and simple error handling
6. Permit easy reversal of actions
7. Support internal locus of control
8. Reduce short-term memory load

Guidelines Review

Reviewers use a guidelines document to evaluate an interface. The guidelines document contains many more items that the list used in a heuristic evaluation, so it may take a long time to review the interface.

Consistency Inspection

Experts verify that an interface is consistent. Factors checked are color, terminology, layout, help, etc.

Cognitive Walkthrough

The reviewers simulate real users of the system and evaluate how well the interface facilitates the performance of common tasks. They also evaluate error recovery.

Formal Usability Inspection

This is similar to a court proceeding, with a moderator or judge. The experts present the merits and weaknesses of the interface and design team members may defend their decisions.

4.3.2 Surveys

Surveys have several benefits, mainly that they are inexpensive and can reach a large number of people. Questions in the survey should be focused in order to be able to draw conclusions from any data presented in the results. Online surveys cost even less than traditional surveys, but may be biased because many people do not have web access.

4.3.3 Interviews and Focus Groups

Interviews have an advantage over surveys because they are flexible. The interviewer can change the questions based upon the interviewees' responses. Also, more detailed responses are possible than with traditional, multiple-choice questions. Disadvantages include cost, time, and that only a few people can be interviewed. Focus Groups can investigate issues raised by interviews and determine if one user's opinion is widespread.

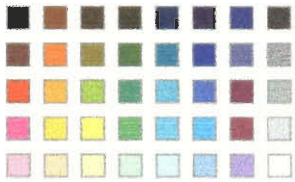
5 Methodology

These are the steps that were taken in designing and evaluating a new user interface for ReCourse.

5.1 Designing the Interface

5.1.1 Colors

Because there is no color scheme that everyone will like, and because instructors may wish to change the colors of the menu to match other pages in the site, the instructor's toolbar includes an option to change the color scheme. Initially, the instructor was allowed to select one of 5 predefined schemes. After a preliminary review it was decided to allow the instructor to choose a scheme that consists of 2 independent colors, each chosen from 40 possible colors. The possible colors are web-safe and are shown below.



Note – colors appear slightly different on a computer screen than on a printed page.

Darker colors have white text, while the light colors have black text. The default color scheme is black and white. More colors can be added easily; details on the procedure can be found in Appendix B.

5.1.2 Menus

Tabbed menus were chosen rather than icons for several reasons. First, a tabbed menu occupies much less space than images. Second, it is difficult to represent the actions pictorially. Although testing has shown that it is fastest to locate menu items when they are ordered alphabetically, users of this system are fairly frequent users and will benefit from functional groupings, with most commonly used functions listed first.

5.1.3 Layout

The layout of this interface is simple – the menu is located at the top of the page and the content is shown below that. The menu item corresponding to the current page is indicated by using another color for the tab. When the user moves the mouse cursor over a tab, the tab color is changed through JavaScript code.

5.2 Implementing the Interface

5.2.1 Image Creation

The images were created using Paint Shop Pro 6.0. The tabs utilize layers, which allow the text to "float" above the background color. This allows the background color to be easily changed at any time without interfering with the text.

5.2.2 JavaScript

JavaScript code was written to change image colors when the mouse cursor moves over a tab. This is accomplished by using two images and switching them when a "mouseover" event occurs. The JavaScript code to accomplish this is shown below.

```
<script language="JavaScript">
<!--
var g_Loaded = 0;
var g_Rollovers = 0;

if(((navigator.appName=="Netscape" && parseInt(navigator.appVersion)>=3) ||
parseInt(navigator.appVersion)>=4))
{
  g_Rollovers=1;
}
else
{
  g_Rollovers=0;
}

function loadImg()
{
  if(g_Rollovers)
  {
  homeOn = new Image(); homeOn.src="student/images/$c1/home_a.gif";
  homeOff = new Image(); homeOff.src="student/images/$c2/home.gif";
  homeBar = new Image(); homeBar.src="student/images/$c1/home_b.gif";
  gradesOn = new Image(); gradesOn.src="student/images/$c1/grades_a.gif";
  gradesOff = new Image(); gradesOff.src="student/images/$c2/grades.gif";
  gradesBar = new Image(); gradesBar.src="student/images/$c1/grades_b.gif";
  bboardOn = new Image(); bboardOn.src="student/images/$c1/bboard_a.gif";
  bboardOff = new Image(); bboardOff.src="student/images/$c2/bboard.gif";
  bboardBar = new Image(); bboardBar.src="student/images/$c1/bboard_b.gif";
  libOn = new Image(); libOn.src="student/images/$c1/lib_a.gif";
  libOff = new Image(); libOff.src="student/images/$c2/lib.gif";
  libBar = new Image(); libBar.src="student/images/$c1/lib_b.gif";
  quizOn = new Image(); quizOn.src="student/images/$c1/quiz_a.gif";
  quizOff = new Image(); quizOff.src="student/images/$c2/quiz.gif";
  quizBar = new Image(); quizBar.src="student/images/$c1/quiz_b.gif";
```

```
 chatOn = new Image(); chatOn.src="student/images/$c1/chat_a.gif";
 chatOff = new Image(); chatOff.src="student/images/$c2/chat.gif";
 chatBar = new Image(); chatBar.src="student/images/$c1/chat_b.gif";
 clistOn = new Image(); clistOn.src="student/images/$c1/classlist_a.gif";
 clistOff = new Image(); clistOff.src="student/images/$c2/classlist.gif";
 clistBar = new Image(); clistBar.src="student/images/$c1/classlist_b.gif";
 passwdOn = new Image(); passwdOn.src="student/images/$c1/password_a.gif";
 passwdOff = new Image(); passwdOff.src="student/images/$c2/password.gif";
 passwdBar = new Image(); passwdBar.src="student/images/$c1/password_b.gif";
 searchOn = new Image(); searchOn.src="student/images/$c1/search_a.gif";
 searchOff = new Image(); searchOff.src="student/images/$c2/search.gif";
 searchBar = new Image(); searchBar.src="student/images/$c1/search_b.gif";
 sitemapOn = new Image(); sitemapOn.src="student/images/$c1/sitemap_a.gif";
 sitemapOff = new Image(); sitemapOff.src="student/images/$c2/itemap.gif";
 sitemapBar = new Image(); sitemapBar.src="student/images/$c1/sitemap_b.gif";

 g_Loaded = 1;
 }
}

function msover(tabName)
{
 if(g_Loaded)
 {
  imgOn = eval(tabName+"On.src");
  document.images[tabName].src=imgOn;

  imgBar = eval(tabName+"Bar.src");
  document.images["bar"].src=imgBar;
 }
}

function msout(tabName,curTabName)
{
 if(g_Loaded==1)
 {
  if(tabName != curTabName)
  {
   imgOff=eval(tabName+"Off.src");
   document.images[tabName].src=imgOff;
  }
  if(curTabName != "")
  {
   barOff="images/bar.gif";
   document.images["bar"].src=barOff;
  }
 }
}
// -->
</script>
```

5.2.3 Perl

There was already code in the perl scripts to load toolbar configurations from a file. This file is course-specific, so each course has its own configuration file that specifies which tabs will be enabled for the course. This was modified to save color scheme information - the two colors used in the toolbar.

The code to generate the toolbar is simple. The script generates HTML similar to the following:

```
<IMG name="bar" SRC="student/images/$c1/bar.gif" BORDER="0" ALT="bar.gif"><BR>

<A HREF = "home.html" onmouseover = "msover('home');" onmouseout =
"msout('home','');"><IMG name = "home"  SRC = "student/images/$c2/home.gif"
BORDER = "0" ALT = "home.gif"></A>

<A HREF = "grades.html" onmouseover = "msover('grades');" onmouseout =
"msout('grades','');"><IMG name = "grades" SRC = "student/images/$c2/grades.gif"
BORDER = "0" ALT = "grades.gif"></A>
```

5.3 Evaluating the Interface

The interface was evaluated twice. The initial interface consisted of five color schemes. After evaluating this interface, it was changed to allow for 48 colors and evaluated again. Both evaluations consisted of two distinct groups of users – students and instructors.

5.3.1 Consistency Inspection

A consistency inspection of the new interface was carried out early in the evaluation process, when it was still possible to change small details. Details examined include:

- Colors – Once a color scheme is selected, all pages for the course should reflect this decision.
- Menus – The menu items will look similar to each other. Also, student and instructor menus will be similar to each other.
- Layout – The menu will be at the top of each page. All that will change from page to page is the content shown in the lower portion of the page.

5.3.2 Cognitive Walkthrough

Several tasks were performed using the new interface. These include:

- A student logs in and checks his/her grades. He/she then prints a list of homework assignments and logs off.

- An instructor logs in, adds a new assignment for a course, updates some grades, and adds online notes to study for an upcoming exam.
- An instructor logs in and creates an online quiz. He/she updates the bulletin board to include information on the quiz and then emails the class to alert students.

The interface was checked for efficiency (no excessive mouse clicks needed), and simplicity. A user did not have to traverse through deep menus in order to perform simple tasks. Also, it was easy to switch from task to task – the user did not have to click the "Back" button on his browser to return to a menu.

5.3.3 Survey

A survey was distributed among students in a "Webware" class [Cruz, 2000]. The students were asked to go to the ReCourse web page, log in, and use the system for a minute. They were then asked to fill out the survey based upon their impressions. The students evaluated the preliminary interface, not the final interface. The results from the 1st survey were used to develop a final interface. Another group of students was asked to evaluate the final interface by filling out the same survey. The survey can be found on the following page. Results can be found in Section 5.

ReCourse User Interface Survey

To access ReCourse, go to http://penguin.wpi.edu:4546. Select Guest101 for the course. The user name is "guest" and the password is "guest". Spend a few minutes looking at the toolbar and moving the mouse over the tabs.

Please fill out the following survey as accurately as possible.

Background

Occupation:
___Student
___Professor

Previous Experiences with ReCourse
___None
___Used ReCourse in a Classroom Environment
___Worked with ReCourse as a project (IQP, MQP)

Usability

Please rate the following by circling the number that best reflects your response to the question.

	Agree				Disagree
1. The menu items are clear and easy to see.	1	2	3	4	5
2. The colors do not distract from the purpose.	1	2	3	4	5
3. The menu items are ordered in a satisfactory manner.	1	2	3	4	5
4. The menu animations do not distract from the purpose.	1	2	3	4	5
5. The menu animations improve accuracy in selecting tabs.	1	2	3	4	5

Appearance

Please rate the following by circling the number that best reflects your response to the question.

	Agree				Disagree
The colors used are pleasing.	1	2	3	4	5
The toolbar design looks professional.	1	2	3	4	5
The menu animation improves the overall appearance.	1	2	3	4	5

Comments

If you have any additional comments, please list them here.

Thank You!

6 Results

6.1 Preliminary Interface Survey

12 students and 1 professor took part in the preliminary survey. The mean, median, and mode were calculated from the numerical answers for each of the questions. Note that 1=agree and 5=disagree.

6.1.1 Usability

	Statement	Mean	Median	Mode
1	The menu items are clear and easy to see.	1.83	2	1
2	The colors do not distract from the purpose.	1.75	2	1, 2
3	The menu items are ordered in a satisfactory manner.	2.42	2	2
4	The menu animations do not distract from the purpose.	1.67	1	1
5	The menu animations improve accuracy in selecting tabs.	1.75	2	1, 2

6.1.2 Appearance

	Statement	Mean	Median	Mode
1	The colors used are pleasing.	2.67	3	2
2	The toolbar design looks professional.	2.83	2	2
3	The menu animation improves the overall appearance.	2.25	2	2, 3

6.1.3 Comments

Few users left comments, but of those who did, the most common was that the colors could be improved.

6.1.4 Overall

This survey indicated that the toolbar design was solid but that the colors were not satisfactory. Better colors could also make the toolbar look more professional. This survey led to a redesign of the toolbar to add more colors and to allow the professor to select the two colors independently of each other.

6.2 Final Survey

6.2.1 Usability

	Statement	Mean	Median	Mode
1	The menu items are clear and easy to see.	1.52	2	1
2	The colors do not distract from the purpose.	1.7	2	1
3	The menu items are ordered in a satisfactory manner.	1.5	2	1, 2
4	The menu animations do not distract from the purpose.	1.23	1	1
5	The menu animations improve accuracy in selecting tabs.	1.64	2	1, 2

6.2.2 Appearance

	Statement	Mean	Median	Mode
1	The colors used are pleasing.	1.1	1	1
2	The toolbar design looks professional.	1.37	1	1
3	The menu animation improves the overall appearance.	1.39	1	1

6.2.3 Comments

Again, few users left comments but all of the comments were positive. Several of the students surveyed had taken part in the preliminary survey and agreed that the new colors were a good decision. They allow much more flexibility.

6.2.4 Overall

This survey indicates that the shortcomings of the original design have been overcome. These shortcomings included poor colors and an unprofessional appearance. Allowing a greater number of colors made the toolbar look more professional, as it matched the web page's appearance.

7 Conclusion

7.1 The Interface

The interface developed and implemented as a result of this project is both more visually appealing and more effective than the original interface. The many colors available give professors significant freedom in page design. ReCourse comes with enough colors to match practically any web page. The ability to add more colors only increases this flexibility.

Standard use of ReCourse does not require the user to understand the details of how the toolbar works. This is desirable since the toolbar was designed with all audiences in mind, not just the college audience that ReCourse was originally designed for. Another IQP that took place at the same time as this one was to add features to ReCourse that would make it suitable for use by high school students. Since the target audience is so large, it was decided to make the interface as simple to use as possible.

7.2 Future Work

A useful feature that could be added in the future would be a tool to easily create new tabs and colors. The appendices of this document explain how to do this manually, but it is a long process that could be sped up by automating it. Doing this would require complex image manipulation, which may be more suited to an MQP than an IQP.

8 Glossary

Mean - Also known as the average, it is calculated by adding together all of the data elements in a set and dividing that by the number of elements in that set.

Median – Calculated by sorting the data elements in the set. The median is the middle number in the set. If there is an even number of elements, the median is the average of the two middle numbers.

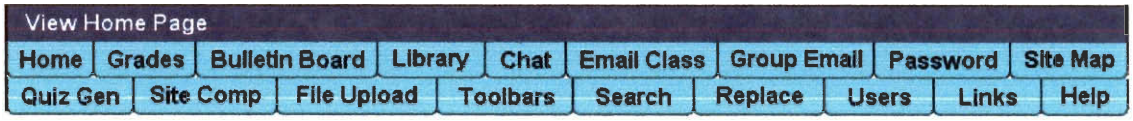
Mode – The mode is the data element that occurs most often in the set. If two or more elements occur the same number of times, the set is multi-modal and therefore has 2 or more modes.

Web-Safe color – A web-safe color is a color that appears the same on all web browsers and platforms. There are only 216 web-safe colors – other colors vary by platform. Using web-safe colors is less important now that it was several years ago.

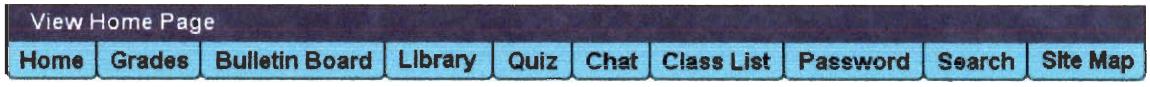
Appendix A – Toolbars

These are the toolbars that were developed as a result of this project.

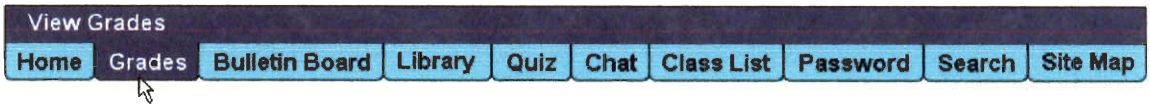
Instructor toolbar:



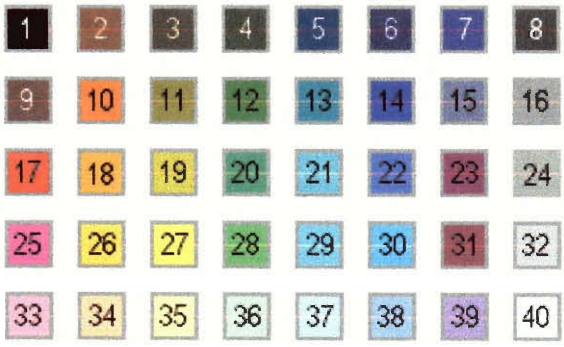
Student toolbar:

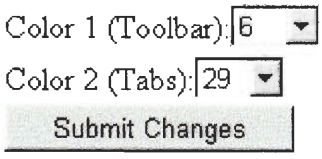


When the mouse is moved over any of the tabs, the color of the tab is changed to match the color of the top bar. The text on the top bar is also changed to match the highlighted tab.



Color selection menu: (found on the instructor menu under "Toolbars")





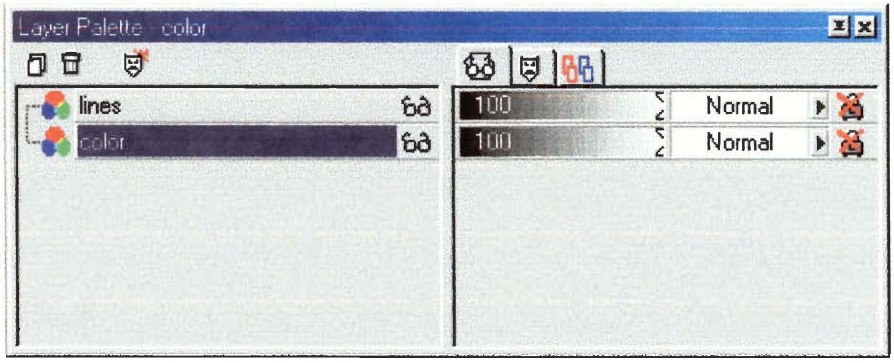
Appendix B – Adding Colors

Although the ReCourse toolbar has been designed to include 40 colors, additional colors can be added in the future. This does not require any artistic skill, although familiarity with the image editing program "Paint Shop Pro 6.0" would help. Adding colors also requires editing a perl script; however all that is needed is a small change which is explained further in this document. It should be noted that the ReCourse toolbar is fully functional with the default 40 colors.

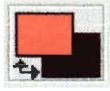
IMAGE Creation

1. Download and install "Paint Shop Pro 6.0". This program is shareware and can be downloaded from http://www.jasc.com.
2. Create a local temporary directory "temp" with 2 subdirectories "student" and "instructor".
3. Copy files from "/users/kal9801/public_html/webrecourse/cgi-bin/instructor/images/psp/text color" to the instructor temp directory.
4. Copy files from "/users/kal9801/public_html/webrecourse/cgi-bin/student/images/psp/text color" to the student temp directory.
5. Copy "colors.gif" from "/users/kal9801/public_html/webrecourse/cgi-bin/instructor/" to the temp directory.
6. Open "colors.gif" and edit the image to display your new colors and color numbers. Do NOT change the numbers of existing colors. Save the finished image.

7. Open one of the PSP files. You may wish to zoom in on the image using the magnifying glass tool shown on the left.
8. In the main menu, click "View->Toolbars". Be sure that the "Layer Palette" box is checked. Click "Close".
9. The "Layer Palette" box should show 2 layers, "lines" and "color". The "lines" layer contains the border lines of each tab and any words that appear on the tab. The "color" layer is the tab color.

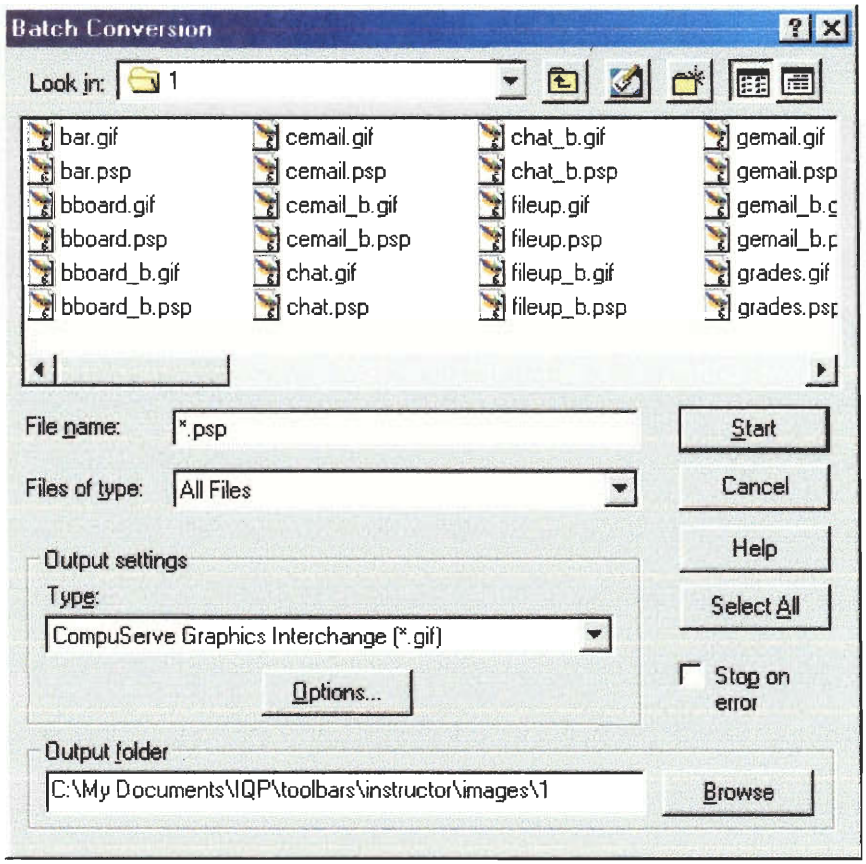


10. Click the "color" label so that it is highlighted in blue.
11. On the right-hand side of the window, you can select a color for the new tabs.



12. Select the flood-fill tool on the left-hand side of the window (shaped like a bucket).

13. Click anywhere inside the tab in the current image. The tab color should change to the selected color.
14. Repeat steps 7-13 for each PSP file in the temporary directories.
15. Finally, convert the PSP files to GIF files. Click File->Batch Conversion. Locate the student temporary directory and select all the PSP files. Under "Output Settings", select "CompuServer Graphics Interface (*.gif)". Under "Output Folder", select the student temporary directory.



16. Click the "Start" button.
17. Repeat for the instructor temporary directory.
18. Delete all PSP files in the temporary directory.

ReCourse Configuration

1. Create the directory /users/kal9801/public_html/webrecourse/cgi-bin/instructor/images/color on the ReCourse server, where color is the number of the color you are adding. Copy the instructor images created into this directory.
2. Create the directory /users/kal9801/public_html/webrecourse/cgi-bin/student/images/color on the ReCourse server, where color is the number of the color you are adding. Copy the student images created into this directory.
3. Copy the "colors.gif" file to /users/kal9801/public_html/webrecourse/cgi-bin/instructor/images/.
4. IMPORTANT: Back up the /users/kal9801/public_html/webrecourse/cgi-bin/instructor/student_toolbar/check_toolbar.pl file!!!
5. Open the check_toolbar.pl file and locate the line "# ENTER COLOR INFO HERE #".
6. Change the next line to set $numcolors equal to the new number of colors available.
7. Save the file.
8. Test the new color by logging into a course as instructor. Click on "Toolbars", select the new color for one of the two colors, submit the changes, and reload the page. The new color should appear.

Repeat these steps for each new color scheme to be added.

Appendix C – Adding New Tabs

Adding a Tab

1. Download and install "Paint Shop Pro 6.0". This program is shareware and can be downloaded from http://www.jasc.com.
2. Create a local temporary directory "temp" with 2 subdirectories "student" and "instructor". Under each subdirectory, create 2 more directories, "black" and "white".
3. Copy files from "/users/kal9801/public_html/webrecourse/cgi-bin/instructor/images/psp/text color" to the appropriate text color directory under the instructor directory.
4. Copy files from "/users/kal9801/public_html/webrecourse/cgi-bin/student/images/psp/text color" to the appropriate text color directory under the student directory.
5. Open one of the tab files that is the same size as the tab you want to add.
6. Open the layer palette and select "lines". Erase the text on the image. Set the current color to black or white.
7. Select the text tool and click inside the image. Set the font to "Arial", the size to 12, and select "Bold". Type the tab text into the box and click "OK".
8. Center the text inside the image and click to place. In the menu bar, click "Selections->Select None". Save the image.
9. Repeat this for each of the 2 color directories in both the student and instructor directories.

Resizing the Menu Bar

1. Open the tab you just created and note the image width in pixels. This can be found by clicking "View->Image Information", under "Dimensions".
2. Open one of the bar images (ending in _b.psp).
3. Click "Image->Canvas Size". Add the number you found in step 1 to the width. Be sure that the two checkboxes under "Image Placement" are not checked. Click "OK".
4. Select the "color" layer in the image and flood fill the new area with the background color.
5. Select the "lines" layer in the image and edit it so that the border line extends all the way to the new right edge.
6. Save the image.
7. Repeat for each bar in each of the 2 color directories in both the student and instructor directories.

Coloring Tabs

Now that the new tab has been created, it is necessary to save it in each of the 40 colors.

1. Follow the instructions in Appendix B to create images for each of the 40 colors for both instructor and student. Note that only colors 1-9 have white text and 10-40 have black text.

Editing the Code

1. Open the file "/users/kal9801/public_html/webrecourse/cgi-bin/student/toolbar.pl".

2. Locate the code that generates the toolbar html. It begins with Javascript.
3. Following the format for existing tabs, add variables for the new tab.
4. Locate the html for the tabs you want to place the new tabs between. Again, following the format for the other tabs, insert code to display the new tab using the variables you declared in the JavaScript. Save the file.
5. Open the file "/users/kal9801/public_html/webrecourse/cgi-bin/instructor/toolbar.pl".
6. Repeat steps 2-4 for this file.

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