SWIM SMART

Rochester Institute of Technology

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

SwimSmart

An interactive and instructional multimedia application

Rebecca Natalie Berent
August, 2010

Approvals

Chief Advisor
Chris Jackson, Associate Professor, Computer Graphics Design

_____

Signature of Chief Adviser   Date

Associate Advisor
Shaun Foster, Visiting Assistant Professor, Computer Graphics Design

_____

Signature of Associate Adviser   Date

Associate Advisor
Marla Schweppe, Professor, Computer Graphics Design

_____

Signature of Associate Adviser   Date

School of Design Chairperson
Patti Lachance, School of Design

_____

Signature of Chairperson   Date

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Abstract

The thesis project, SwimSmart, created by Rebecca Natalie Berent, is an instructional CD-ROM designed for coaches and intermediate to advanced swimmers seeking to improve upon their swimming skills. It is designed for use on both a projector for group training and on a personal computer as an individual teaching aid, and it runs by inserting it into a computer. The CD includes videos depicting proper swimming technique and is organized within a graphical interface broken down by stroke technique, coach advice, and tips, exercises, and downloadable practice routines. There are two additional sections devoted to credits and an explanation of the application, and a library where the user can watch all videos found throughout SwimSmart in one place. The program is interactive, meaning the user uses the mouse to click through and view various types of content related to swimming.

Teachers and professors typically use some form of multimedia to assist in instructing students in the classroom. The intent of SwimSmart is to improve upon a physical activity using the same principles behind the instructional multimedia used in classrooms. The physical skill is depicted by video that captures the actual movements of a swimmer, along with demonstrations of exercises, practices, and drills. These demonstrations are explained in terms of the muscles they affect as well as how they will improve personal swimming skills, times, and strokes. There are also sections devoted to common mistakes swimmers tend to make and how to correct them.

For the creation, design, and implementation of SwimSmart, videos were shot, edited, and made into short, stand-alone clips, which were then combined and organized into a structured format within the SwimSmart application. Each clip is devoted to an area of swimming and is set up like a short documentary of the particular topic or subject.

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Video content includes coaches giving advice and explanations of strokes, swimmers in the pool demonstrating various aspects of swimming, and dry-land training.

The designer shot and edited video of coaches and swimmers and created videos to teach the principles of swimming and the various strokes and to present drills, exercises, and other content. All the videos were combined into a dynamically generated video player embedded within a graphical interface using ActionScript and XML code and Adobe Flash. Adobe Photoshop, Adobe Illustrator, Adobe After Effects, Adobe SoundBooth, Adobe Premiere, and Adobe InDesign were all used to create elements for the application, including its brand, video and user-interfaces, buttons, photos, imagery, icons, and more.

Positive usability testing showed that the application was easy to use and understand, well organized and designed, and educational. Additional materials that accompany the CD are CD labels, a user guide, and posters marketing the product.

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Introduction

Problem Statement

Instructional multimedia is used in classrooms all the time to assist teachers in instructing their students on different subjects. The goal of SwimSmart is to show that the same approach can be applied to using instructional multimedia to improve upon a physical skill. The application is designed to encourage learning and improvement in swimming among intermediate to advanced swimmers aged 12 – 18, and/or their coaches, through a packaged interface including video, imagery, text, and other multimedia elements.

Perfecting a sport, like any other repetitive activity, requires practice, encouragement, and assistance. With so many people using computer software to aid in individualized instruction and classroom learning, I was curious about how much multimedia I could put together into one "shell" to most effectively teach, or facilitate improvement in, a physical activity. Because swimming has always been a favorite sport of mine and I was a member of various swim teams growing up, swimming seemed an excellent fit for the project.

Background Information

Swimming is both an individual sport in which you compete against yourself to increase your best time, etc., and a team sport in which you compete against your own teammates and other teams. Your skills are yours only, and you do your part as an individual in meets and races in order for your team to win based on technique and speed. Because of this, coaches often cannot address every single problem each swimmer might have, and often poor techniques are missed or not corrected, sometimes because the swimmer might be fast but employ improper techniques. Thinking about the instruction that not only I, but other swimmers lacked in terms of training, I thought about which kind of instruction was the most

effective in helping me to learn how to swim, and I did a lot of research on how others learn to swim. I shot video that showed real swimmers doing drills, strokes, starts, and turns so that I could effectively communicate those actions for others to adopt in learning how to swim more effectively. A point that is stressed in the program is that watching videos to improve upon stroke technique is great, but video-taping yourself is even better because then you can see exactly how your body moves as you seek the "correct" or "proper" methods and techniques.

Although there are DVDs and videos out there that are designed for swimming training, there are no stand-alone products, websites, or DVDs that address all areas of swimming in one place. That is, there are none that provide a variety of means to access the information through media like video, audio, photos, text, animations, and other audio-visual content. Available DVDs and videos are typically extremely in-depth, with one stroke or technique covered per volume. This means an individual must purchase multiple volumes in order to address problems with each stroke and even more volumes to help with turning, starting, breathing, etc. There are also, for free, several-minute-long Youtube.com videos that address specific areas of swimming, but these are stand-alone short video clips that each needs to be sought out separately. As noted before, SwimSmart differs from these other sources because of its comprehensive structure and organization, as well as its multimedia format and interactivity for understanding and learning the content.
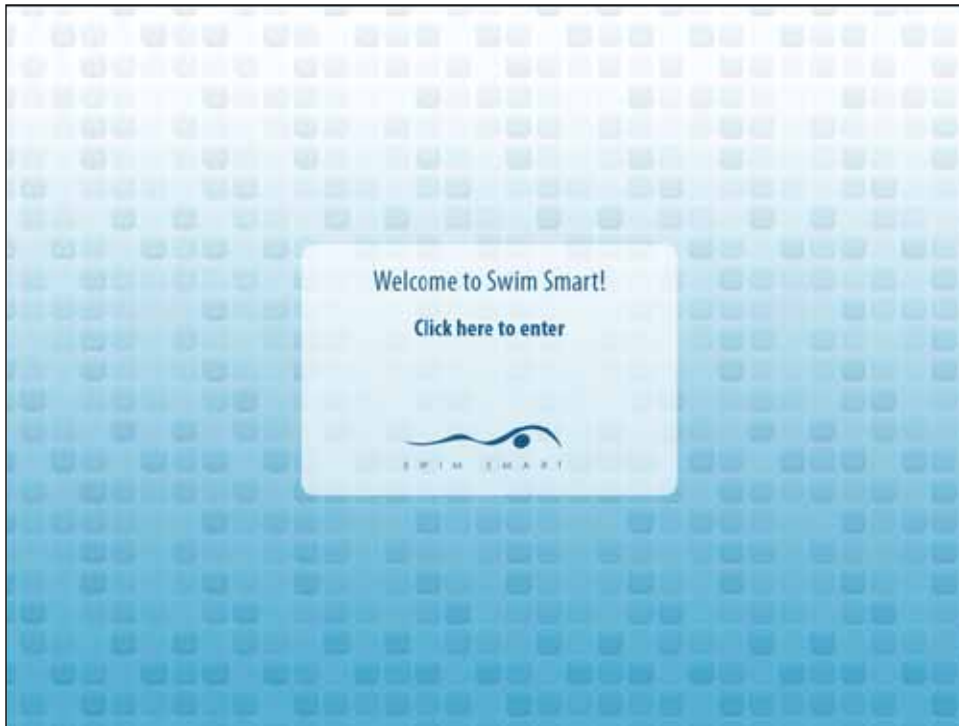
Introduction Screen

This is a screenshot of the intro screen that users see when the SwimSmart CD is inserted in a computer. Clicking enter launches the screen below.

The purpose of having this initial screen is to introduce the application with it's name and logo, and to indicate to users that the application involves user interactivity (clicks).
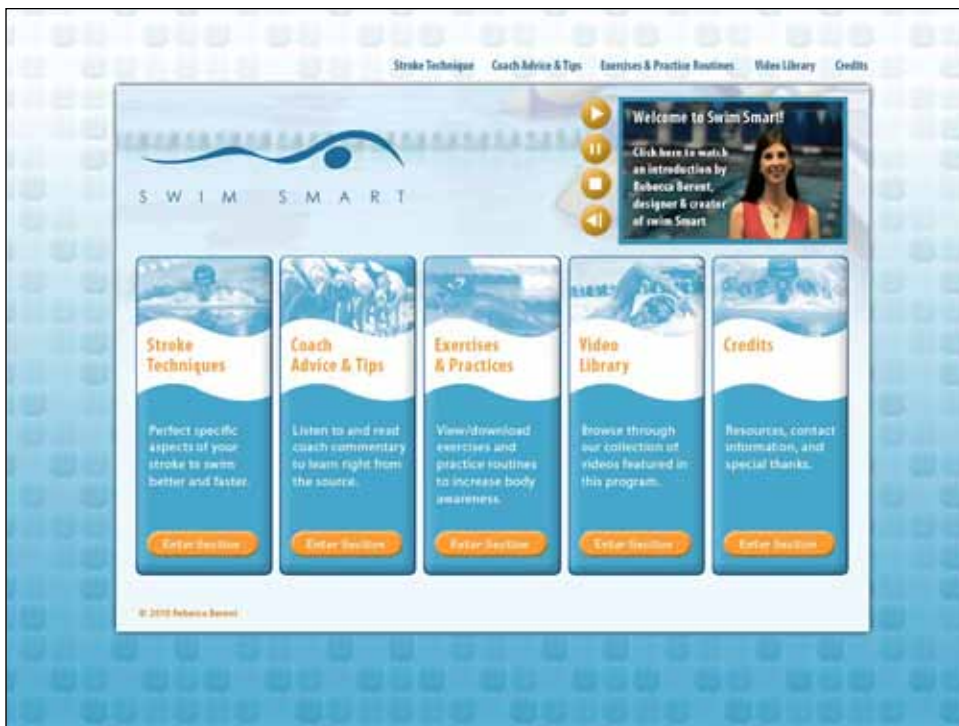
Main Menu

This is the main menu to the SwimSmart application where users can click on the particular section they are interested in. There is also a video introducing the user to the program and how to use it. The video is set up with user controls. Buttons are available to click on to navigate to each section, and again as smaller links at the top of the interface.

Application Overview

All elements in the SwimSmart application were designed using Adobe Photoshop, Illustrator, After Effects, InDesign, and Premiere, and coded using Adobe Flash and ActionScript. Video was shot using a Canon XF300 and a tripod, and the shoots included coach interviews, coach advice and stroke overview and technique, swimmers performing each stroke and subject area covered, dry land training exercises, and scripted voice-overs based on book and Internet research. SwimSmart was created to teach and enhance swimmers' knowledge and proficiency in the sport of swimming, organizing content in a clear and relatable way for swimmers to understand. The final product is a multimedia application combining text, audio, visuals, and video in an interactive fashion.

SwimSmart opens to an intro screen with simple branding and one link to enter into the program. The purpose of the screen is to prepare users for what they are about to enter by providing the logo and name of the application. Once in the application, the user is directed to the main menu page, which includes a brief video introduction by me, and five options for navigating throughout the program. The five sections are "Stroke Techniques", "Coach Advice and Tips", "Exercises and Practices", "Video Library", and "Credits".

Stroke Technique Section

This is a screenshot of the "Stroke Technique" section where users can read an overview of the content available, watch specific videos targeting common problem areas, read short, text tips that scroll at the top of the page, watch a looping video of swimmers performing the various strokes in the water, or navigate further into the program by choosing one of the four stroke sections (Freestyle, Backstroke, Breaststroke, Butterfly).

All main sections operate the same way as "Stroke Techniques" in that there is a blurb of introductory text, scrolling textual tips, buttons to sub-sections, and videos available to watch.

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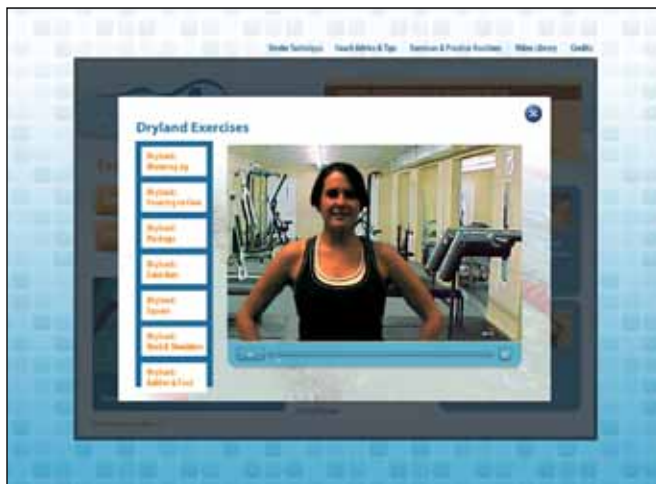
All main sections operate the same way as "Stroke Techniques" in that there is a blurb of introductory text, scrolling textual tips, buttons to sub-sections, and videos available to watch.

Video Player Example

Each time a user clicks to view a video clip, a new window animates in and the rest of the interface (the background) darkens. Depending on which video the user clicks, an XML file is loaded into the player and thumbnails, as well as the video player, with controls, is loaded. The user can then watch the video they chose, and/or scroll through the list of various related videos on the left, shown as thumbnails with the video's title.

Video Tip Example

In each of the stroke sections, there are tips devoted to just that particular stroke, in short, 10-30 second long clips. These tips are dynamically loaded into a similar video player as the one above, but in a much smaller format, with the controls and thumbnails immediately appearing on the screen without the user having to launch another window. The title of each tip is displayed to the right of the video player, and the user can switch quickly between the different tips offered.

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Content Outline

Based on book and online research, I wrote scripts for audio voiceovers in several sections of the SwimSmart application. For coach interviews and advice, I provided the coaches with outlines of what I was going to be asking them to describe or explain, and asked them to speak freely about the subject areas they were most familiar with, and answer honestly to those they weren't. I found that all coaches were very competent in all areas of swimming, and although I followed my outlines in terms of the questions or topics I asked them to cover, they clearly knew the subject matter better than I did and were able to give me a lot of the crucial, opinion-based coach advice I was seeking.

When shooting the coach interviews, I asked the coaches open-ended questions about their backgrounds and how they got started in the sport of swimming. This part went the smoothest because my talent was able to speak freely and openly about themselves, and their personal history in the sport of swimming. These are especially powerful clips because both coaches who spoke on the CD relayed positive messages of encouragement and admitted to struggling in the sport themselves when they were young. They both gave advice on how you can cope with the stress of being on multiple swim teams, having early or multiple practices a day, getting injured, being the best you can, and dealing with difficult people in the sport, as well as other important information that swimmers using SwimSmart will be able to relate to, and hopefully learn from.

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For the dry land portion of the training, I wrote a description of each exercise that needed to be demonstrated, and asked my fitness model, Jessica Dinaburg, to explain the exercise while performing it on video. Initially it was hard to get good audio levels of Jessica because she was moving while speaking. After several attempts I also found that it was difficult for her to remember everything she wanted to say while she demonstrated. After running into these problems, I had her perform all the exercises without speaking, and afterwards we went into a sound booth located in the Computer Graphics Design lab, and recorded the audio to combine with the video clips. This worked very well and during the editing process I was able to extend some of the exercises based on the audio in order to most effectively convey proper technique.

When filming the swimmers in the water, I provided each one with an overview of what I'd be having them swim (based on previous conversations with them regarding their best strokes) and had them begin by warming up in their preferred manner. I filmed everything. I wanted to be sure that I not only got footage of what I planned to get (each stroke, certain drills, turns, starts, etc.) but also each swimmer's own technique and routine for warm-ups, warm-downs, and even just downtime in the water (for example, I filmed one swimmer treading water and another floating on her back for her warm-down, which I added as an additional clip without initially planning on it.) The swimmers' shoots went okay, in terms of the talent and strength of the swimmers' strokes. However, I wasn't able to be as creative as I'd hoped in terms of the video angles because of the limiting environment at a swimming pool (especially indoors in the winter), and the restrictions I had regarding having only my swimmers in the frame, and no one else. I would have liked to have gotten some shots from above, or shots from an angle where some aspects of the stroke or drill could have been clearer, but even though I tried different techniques at each shoot, I was not able to do so. However, with the coach video/audio combination, the video clips of swimmers are explained in depth by both the

swimmers and the coaches describing the techniques. In the future, I would certainly like to shoot again, in a different environment, during a different season, and with a camera and tripod that would allow for various creative angles.

I wrote the text accompanying each section from my previous knowledge of the sport, research in books, and online, and research from the interviews and advice from all the coaches I talked to, not just the two featured in the application. The bulk of the application is video, but I wanted to include some text to explain the sections, give brief overviews of each stroke (Freestyle, Breaststroke, Backstroke, Butterfly) and drill, and give instructions for user interaction. The textual aspects are intended to strengthen and add to the rich video content. I also wrote text for the downloadable practice routines based on input from the coaches involved, as well as from several online resources for routine suggestions and best practices.

Survey of Literature

Swimming Books

The Triathlete's Training Bible

by Joe Friel

VeloPress; Third Edition, February 2009

This book is not just intended for swimming, as it says in the title, but it is still a great guide for setting yourself up for regular workouts, preparing for swim meets and other races, and learning basic technique for swimming as fast as you possibly can. Because this book is intended for people who are competing in a triathlon (or the like), it is a great resource for improving speed. Although stroke technique is emphasized less, streamlining, and other important tricks to going faster in the water are covered, as well as how to train, what to eat, how to improve body composition, breathing techniques, and more.

Complete Conditioning for Swimming

by David Salo

Human Kinetics, June 2008

This book contains everything an advanced swimmer or coach needs to know in perfecting a swimmer's technique. From warming up, tailoring strokes, to diving, starting, flip-turns and cool-down, there is a wealth of information here. Because the book is written for an already experienced swimmer, it is similar to the way content should be presented in SwimSmart.

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Fitness Swimming

by Emmett Hines

Human Kinetics, June 2008

This book starts from the ground up in terms of learning to swim but it moves quickly and covers all areas of swimming, from the beginner to the advanced. This book provides workouts that are broken down by the goal of the training. There is speed training, strength training, stroke enhancement, etc. A lot of the content here will be useful for the workout and training sections of SwimSmart.

Total Immersion: The Revolutionary Way To Swim Better, Faster, and Easier

by Terry Laughlin

Fireside, January 2004

This book demonstrates how to perfect swim performance and shows the correct body positions to enhance stroke technique. The book includes drills that help swimmers strengthen their bodies correctly – both in and out of the water – along with visuals that help in perfecting strokes. This will be an important contributor to my project for both the actual content, but also for the special tips that will pop up throughout. This book will be especially helpful because it offers alternatives to the traditional way of learning to swim, encouraging technique over speed. Although this can be seen as being counter productive, it generally leads to more experienced swimmers in the long run.

The Fit Swimmer: 120 Workouts & Training Tips

by Marianne Brems

Human Kinetics, October 1994

This book gives a very detailed explanation of how to coach swimmers. It is filled with tips and techniques for improving skill. There are also important sections that explain how to teach or correct certain common problems swimmers encounter. This ranges from lazy ankles, to wrong breathing methods, and more. This book is aimed towards swim coaches and teachers. I will use this book to learn more details about competitive swimming, along with ideas for pop-up tips in my application.

The Swimming Drill Book

by Ruben Guzman

Human Kinetics, November 2006

This book contains multiple drills for each stroke (Freestyle, Backstroke, Breaststroke, Butterfly) in a comprehensive fashion with photos. Most of the captions site a specific drill and ideas for improvement or encouragement from a coach's standpoint, which is extremely valuable for the swimming tips that pop up throughout SwimSmart. I also used an assortment of the suggested drills to create my practice and exercise routines that are available to download in the exercises section of SwimSmart.

Swimming Contacts

Karl Dobosz,

Brighton JV Swim Coach and swimmer

Karl has been swimming since he was very young and currently still holds 5 top records at his high school where he graduated ten years ago. He is now head swim coach of the boys' team at Brighton High School and has been assistant coaching since college. When he was younger, he had the best stroke technique in the district and was regarded as one of the fastest swimmers in his age range. He will be the source of a lot of information, as well as providing insight as both a swimmer and a coach.

Mike Cahill

RIT Swim Coach

Mike is the head Swim Coach at RIT and through several in-person and video-taped interviews will provide valuable information and content for the SwimSmart application.

Chrystal Marcotte

Swimmer, coach

Chrystal has been swimming since she was very young, and she will be the swimmer focused on for the bulk of the video content. She is an excellent, strong, and powerful swimmer with incredible technique. She works out regularly and is able to not only demonstrate swimming, but will help with the dryland portion of the application as well. She will also provide insight into improvement for swimmers using the application.

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Sarah Kimball

Swimmer

Sarah has been swimming since she was a young child and swam on various swim teams growing up. Her best strokes are Freestyle and Backstroke, so I plan to use her to focus on those two strokes specifically.

Elizabeth Whicter

Coach/Swimmer

Elizabeth has been coaching swimmers aged 8-13 for the past five years. She knows a lot about instructing younger swimmers and understands how they learn. She is also a strong swimmer herself. Her best stroke is Butterfly, a stroke many swimmers have trouble perfecting. I plan to use Elizabeth for most of the butterfly drills. She will be an important source of information for how swimmers learn as well as explaining the best ways to correct stroke technique in younger swimmers.

Kristen Curtze

Coach/Swimmer

Kristen is on the RIT Swim team and has been swimming since she was very young. She also coaches middle-school swimming and she can provide valuable insight into how young swimmers respond most effectively to a particular coaching style. She may also swim for the swimming section of the application.

Jessica Dinaburg

Fitness Model

Jessica, who has swum competitively in the past, is passionate about fitness and exercise. Aside from knowing a lot about proper technique in terms of general (dryland) workouts, she also is a confident and outgoing model who will best be able to guide the user through doing the dryland routines, as well as possibly introducing other areas of SwimSmart.

Swimming Websites/Electronic Materials

Swimming on About.com, 2009

Mat Luebbers (and guest writers)

http://swimming.about.com/

September 19, 2009

This is an all-inclusive section of about.com that explores the sport of swimming.
The intended audience for this content is swimmers, coaches, and anyone who wishes to
learn or improve their swimming and can read and follow directions online. Among the many
topics covered on this site, one can learn about stretching, turning, all different stroke
techniques, breathing, medleys, practices, common swimming problems, coach direction,
and more. This is a resource I will use in developing the content for the DVD.

Swimming on WonderHowTo.com, 2009

*http://www.wonderhowto.com/how-to/video/how-to-do-hand-technique-drills-to-improve-
swim-stroke-skills-251986/*

September 20, 2009

Similar to About.com in that it is a site where many topics are addressed, WonderHowTo.com
has a section devoted to swimming. Different from About.com, however, this site has video
tutorials that teach the topic of interest. This site is aimed at any age group that desires
to learn to swim or become better because reading is not required to learn and view the
content. This is going to be a very valuable site for me in the future so I can learn the best
technique for teaching and enhancing skill technique through video. I plan to study the
angles of which scenes are shot, in combination with other video references, to determine
some of the most creative angles used by those who film swimmers.

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Swimming on Learn4Good.com, 2008

Learn4Good Net

http://www.learn4good.com/howto/learning_to_swim.htm

September 19, 2009

Another site about various topics has a great section on swimming. This site breaks down the strokes – teaching technique on how to do each individual stroke and get the most out of it. The most interesting part of the site is the way it breaks down movement into leg and arm movement, and explains in detail when each series of movements should occur. This information will be valid in the content of the DVD.

Swimming on Sportsvideos.com, 2004

http://www.sportvideos.com/products.asp?catID=92

September 19, 2009

This site provides instructional DVDs for learning to swim. Although I am not able to preview the content on the DVD, I would like to obtain them so I can learn a possible way I might want to integrate video into my application. Although there are many clips on Youtube, and other sites like it, these are complete DVDs going over every detail of each stroke. I might be able to use these to help with both the way to capture video (angles, lighting, etc.), as well as what areas of swimming are usually covered by competing swimming videos.

Youtube.com

There are numerous videos available for free on Youtube.com that I plan to study for help on video angles and framing subjects when shooting in a pool/water environment.

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E-Learning Books, Websites/Electronic Materials

e-Learning by Design

by William Horton

Pfeiffer, July 2006

This book provides guidance for making the best decisions for effective e-learning. It covers how to engage users by providing fun, interactive activities. It also teaches how to create learning games, simulations, tests, and assessments online. This book is targeted towards instructional trainers and educators who want to take learning to the next level. It will likely be helpful to me in making certain decisions about how content should be displayed, taught, presented, covered, etc.

Designing Web-Based Training: How to Teach Anyone Anything Anywhere Anytime

by William Horton

Wiley, February 2000

This book discusses the process for building a multimedia application by considering the different approaches, framework, structure, and processes for various types of learning. The book asserts that it is important to know *how* to teach what you are teaching. There are many different methods for distributing information through e-learning, and depending on which approach is taken, different results will be obtained. The book also contains troubleshooting information for technology hurdles, as well as distribution, pushing boundaries, and more information about creating and implementing cutting edge applications that work the way they're supposed to. The book is aimed towards college and graduate students, as well as people in the industry who want to learn more about the process of creating an effective teaching solution.

Multimedia-Based Instructional Design : Computer-Based

Training, Web-Based Training, and Distance Learning

by William W. Lee

Pfeiffer, April 2000

This book is a more technical view at multimedia-based training as it focuses a lot on the planning stages, structure, and evaluation of a project as much as it focuses on actual development. This book is aimed towards college and graduate students, professors, and professionals in the industry who wish to create a multimedia project most efficiently. This book will be useful for the planning of the project, including the set-up of my schedule for the duration of the project.

The E-Learning Handbook: A Comprehensive Guide to Online Learning

by Saul Carliner

Pfeiffer, April 2008

This book goes into the details and in-depth information about what e-learning is, how it is effective, and what is the best way to use it. A large section of the book is devoted to technology issues, something that I will need to do a lot of research on before beginning to develop the application. This book is aimed at designers and developers who are beginning an e-learning project. It covers all groundwork that must be addressed before beginning the project, and then information about how to solve problems as they arise.

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Learning About Instructional Design from Video Games

Libraryvoice.com, 2009

http://libraryvoice.com/instruction/learning-about-instructional-design-from-video-games/

September 19, 2009

This is an article that encourages readers to pull instructional design elements from video games in order to most effectively teach content. This is itself a great start for a discussion, but also plays directly into the DVD's goal: to be a fun, effective way of learning to improve swim technique while keeping the users focus and attention. I will use this article to reference different types of video games and how they can be interpreted and used to express swimming techniques.

Flash CS4: The Missing Manual

by Chris Grover

Pogue Press, December 2008

This book is a complete guide to Flash CS4 and covers all new aspects to Flash, as well as the traditional methods that have been carried over. This book is aimed towards Flash designers and students. I will need this book for the duration of the project so I can troubleshoot Flash and Actionscript problems as they arise, and also so I can create the content in the way I intend to, with a comprehensive guide to use along the way.

How People Learn: Brain, Mind, Experience, and School

by The Committee on Developments in the Science of Learning

National Academies Press, September 2000

This book interprets how different people learn and which teaching methods are the most successful in which areas of study. This book is aimed at educators who want to know the most effective way people learn, and to developers of learning materials. This book will be helpful in addressing the best way to teach the information in the application.

Don't Make Me Think

by Steve Krug

New Riders, August 2005

This book will be a valuable resource for me in terms of making the SwimSmart application as straightforward and easy as possible for people to understand. The book offers tips, techniques, and examples that all deal with how a user interacts with an interactive multimedia application. An important point that is emphasized is that users tend to scan information and not necessarily read it. This supports my plan of providing content in the form of video and supplying the user with small amounts of supporting text in order to best keep their attention and interest. This book will be a valuable tool to reference throughout the creation of SwimSmart, or whenever I start to get off track with the initial, plan of a simple and straightforward layout and design.

Designing Online Learning with Flash

by David Richard Moore

Pfeiffer, January 2009

This book provides users with a model of learning that is appropriate for online learning. It teaches how to integrate Flash applications with the content that needs to be taught, and the most effective way to do so. The book covers how to teach ideas, facts, concepts, principles, and procedures using a commonly used teaching theory. It is aimed towards designers and trainers developing e-learning applications.

Friends of Ed

Friendsofed.com, 2009

http://www.friendsofed.com/

September 21, 2009

This site will be crucial throughout the development of SwimSmart as an online ActionScript/Flash code troubleshooting tool.

Lynda.com

Lynda.com, 2009

http://www.lynda.com/

September 21, 2009

This site will also be a very important troubleshooting tool throughout the development of the ActionScript/XML/Flash code for the SwimSmart application.

Process

Program Goals

The goal of SwimSmart is to encourage learning and improvement in swimming among intermediate to advanced swimmers aged 12 – 18, and/or their coaches, through a packaged interface including video, imagery, text, and other multimedia elements. SwimSmart is designed for successful online learning and improvement by addressing the specific needs of young swimmers and by presenting information in clearly and concretely. The research for the project focused not only on the sport of swimming and the coding, design, and implementation of the application, but also on the way people learn and interact with multimedia tools. Researching all of these components guided the creation of SwimSmart through best practices.

Target Market

After initially targeting an older audience for SwimSmart (advanced college-age swimmers), I met with the head swimming coach at Rochester Institute of Technology, Mike Cahill, and learned some crucial information regarding targeting different age groups. Swimmers who are entering college to swim for a college team most likely have been swimming for a long time and have developed solid personal techniques. Once a swimmer has his or her own style and swim their best and fastest, it is very difficult to re-train them in any problematic areas of stroke technique. Therefore, the decision to switch my target market to middle and high school-aged swimmers capitalized on the assumption that they younger the swimmer is, the more likely learned behaviors can be changed or re-directed. That being the case, although the content was still developed for intermediate to advanced swimmers, the dialogue and organization was more targeted to younger swimmers who may not have perfected various areas of the sport or who still have specific problems with strokes, turns, or other elements

of swimming. When testing SwimSmart, I indeed found that younger students (aged 12-18) actually navigated the program with more ease than older users (19-28) and found it more helpful than the older users for actually mastering the content.

Branding and Design Solutions

A lot of time was spent coming up with a logo and title for the application. I knew I wanted the word "swim" or "swimming" in the title because a straightforward title referring to the program's content would be important for marketing the product. A quick scan of the title tells you that this is some kind of tool for swimming. I added the word "smart" because I felt that, after using the program, users would become smarter in how they swim and more aware of their stroke techniques. The word "smart" also relates to learning, which helps explain that the program is a learning tool for swimmers.

Because of the various print materials that accompany SwimSmart (practice routines, exercise sheets, posters, a user guide, and the label on the CD itself), I knew that having a strong brand and identity was important. I knew that I wanted SwimSmart's logo to be a swimmer, but I also wanted to make the logo something a little more abstract. I created over 50 different variations of a swimmer's body, drawn in an abstract fashion, with the head placed under the arm, as if the swimmer is reaching overhead to pull a stroke.
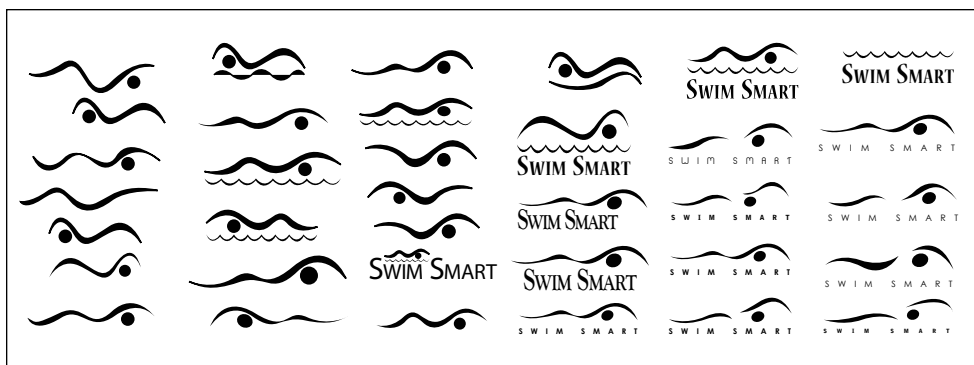
Logo Study
When creating the identity for SwimSmart, I did an extensive logo study to find the best combination of curves and text to represent a swimmer's form and the feeling of fluidity in the water. Here is a sample of some of the logos I created during the planning process.

I played with the curves to mimic not just a human body but also the fluidity of water and the curves of waves. I also did extensive review of typefaces and spent a lot of time deciding on a font and how to treat the text. During the branding process, I also established a color scheme of different shades of both blue and orange (as an accent color). The color scheme represents water and swimming, while making sure important information, links, and buttons stand out in orange. The logo, combined with the color scheme, was the first step in my process and really established a set of rules that I was able to follow during the design phase. I found that I had to mock-up layouts in order to determine the best color combinations. Once that was established, it was much easier to mock up a strong, grid-like interface design to follow.
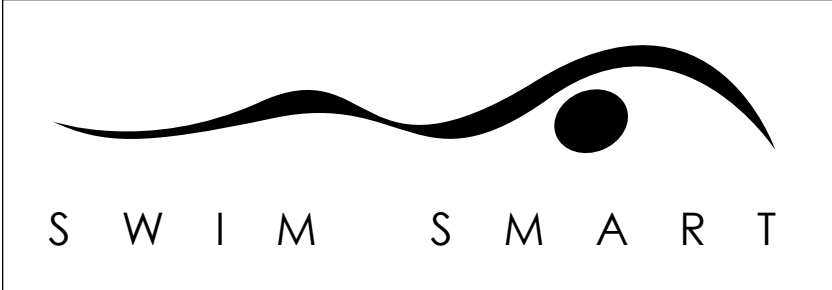
Final Logo
This is the final logo I decided on after completing my logo study. The curve and placement of the "head" really emphasizes the beauty of a swimmer in the water, and the text is simple and readable.
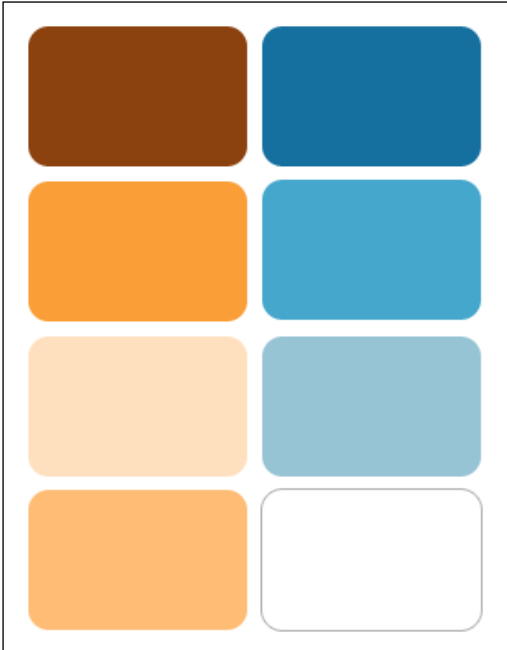
Color Combination
This is the color combination that I used in the SwimSmart application. The blues represent water and the orange/brown/cream is used as my accent color.

Application and Video Interface Design

The background image that appears around the edges of SwimSmart's main content area mimics pool tiles that might line the walls of a pool. Using a slight bevel and testing various levels of opacity and gradient overlays, I came up with a really strong pattern that serves as the basis for the program. The same tile pattern appears elsewhere in associated print materials and videos and as part of my overall branding. Once I had my color scheme and the tile background created, I started to play with how the content would fall into the layout of the interface. I read several books about interface design and creating a multimedia teaching application, as well as books like *Don't Make Me Think,* which deals with usability and ease of information access. Before designing the final interface, I made a list of the most important aspects of my program that would not only make it differ from other teaching applications but would make it stand out as an effective tool for teaching a physical activity. Based on web and multimedia usability books and guides, as well as my own personal experiences and views, I felt that it was very important that the user not have to scroll—ever. SwimSmart includes rollovers and dynamic content that allows the user to update the page they are looking at without going to a different one and without having to scroll. For example, swimming tips are dynamically loaded into a video player showing the different tips. If the user wants to watch a different tip, clicking on its link dynamically loads the video in the same player, allowing the user to see it immediately, again, without scrolling or navigating to a different page.

Dynamically-Generated Swimming Tips
This is a screenshot of the dynamically-generated tips. The user just has to click on one of the links to the right of the small player to switch to another tip. The tips are present on each stroke's sub-page and the user does not have to do any scrolling in order to view all available tips.

Another important aspect of the interface design is the wave motif. Fluid curves with variation

in height and wavelength can add effective dimension to an otherwise dull page. I used

this curve idea for part of the banner of SwimSmart, and I used it again in the videos as the

introduction screens. Because the video interfaces are not static like the application

background, I decided to play with movement in the otherwise static curves. I chose a subtle

light burst that travels along the path of the curve, accenting it, while introducing the subject

of the video and the coach speaking. The curves and wave elements can be found in all

materials throughout SwimSmart. The printed work has static curves that use variation in

wave height and length to add dimension, and the multimedia aspects use a more dynamic

curve to accentuate the theme of water and fluidity in the pool.
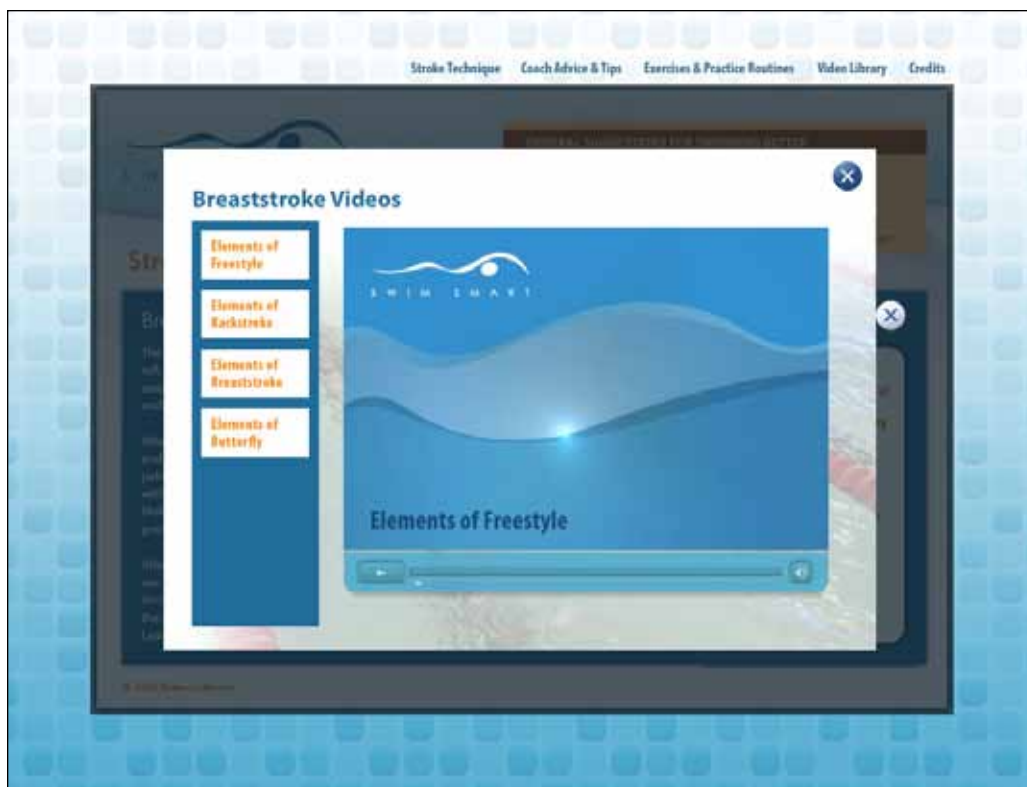
Video Shooting and Editing

Part of the initial goal of SwimSmart was to instruct users in how to perform a physical activity or sport within a variety of different teaching approaches, in the hope that at least one of the methods of information delivery would be a preferred learning method for as many users as possible. For example, the content is delivered a) in a textual format, through the scrollable tips at the top of the page; b) in a visual format, through photos and videos of swimmers demonstrating the activity, exercise, or stroke technique; and c) through audio, with the accompanying coach commentary, explanations, advice, and suggestions heard throughout SwimSmart.

To capture the audio and video, I set up twelve separate shooting sessions during which I would capture video of swimmers in the water, coach advice and commentary, dry-land exercises and workouts, or interviews and, at one shoot, swimmers at a swim meet. Initially I planned to shoot all interviews and commentary in front of a green screen and edit a background in, but I found that there were nice areas in which to film my subjects, like outdoors and, in some cases, in an office or other indoor area. Five of the sessions were devoted to capturing commentary and advice from coaches and the dry-land trainer. I shot all swimming footage at the RIT swimming pool under the supervision of coach Mike Cahill. I shot the exercises and my introduction and interview in front of a green screen in the Computer Graphics Design lab at RIT.

I used a Canon XF300 video camera and a tripod, and sometimes a Sony Handicam (to experiment with different angles) to shoot the majority of the footage.shoot the majority of the footage. I also used a Nikon CoolPix S4000 to shoot some of the photos used throughout the interface. I used the Computer Graphics Design sound booth to record audio to accompany the dry-land footage.

To import and edit the audio footage, I used Adobe SoundBooth, and to import and edit the video footage, I used Adobe Premier. I also used Adobe After Effects with every video to add the video intro and exit sequences. I also used After Effects to create titles and other textual and visual content used to enhance some of the video footage.

I broke up the content into video snippets in order to have shorter videos to help users pay attention, to keep them interested, and to avoid bombarding them with too much content.

Coach Advice (Dynamic Video Player)

This is a screenshot of one of the Coach Advice videos that are found throughout the SwimSmart application. Here, Kristen Curtze demonstrates how a swimmer can be sure that they have a strong and correct body roll when swimming Freestyle and Backstroke.
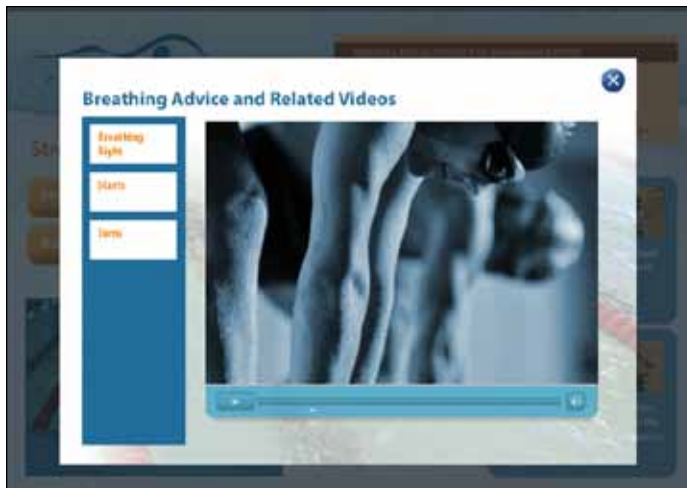
Drills, Starts and Turns (Dynamic Video Player)

This is a screenshot of one of the Drill videos that are available in the Practice and Exercises section of SwimSmart. The video includes photographs that scale and move in a "Ken Burns" style, video footage of swimmers in the water, and clips of coaches explaining the footage that is playing.

Stroke Technique (Dynamic Video Player)

This is an up-close screenshot of Chrystal Marcotte swimming butterfly in the Stroke Technique section. Strokes are shown, and then broken down and explained by text and coach commentary.

SWIM SMART

Coding

The first step in coding the interface involved writing XML and ActionScript to dynamically load all videos. I created a video player that, when interacted with, populates the video player with the specific video chosen by the user. ActionScript is used to make the player, and when a video is chosen, the associated XML file tells Flash player which video to play. Setting up the video sections this way made it much easier to add to, delete from, or rearrange. A snippet of this code is shown on the following page, and the full code is available in the appendix.

I also wrote ActionScript to create a hard-coded video player for the main menu page, that allows the user to play or pause a video introduction that loops. I also created another hard-coded video that loops a video of all strokes in each of the main sections. Instead of a photo gallery on each page, I chose to include video in order for the user to have something they can constantly focus their attention on without having to click to view another (as you would in a photo slideshow). ActionScript also operates the entire application shell and allows different sections to be loaded and unloaded depending on user interaction.

A "Tips and Tricks" section at the top of each of the main sections is created using ActionScript and Flash mask layers to create the scrolling effect the user experiences when clicking to the next tip. When clicking the "next" link, the ActionScript scrolls the movieclip to the specified position in order for the user to see the new tip.

Script Assist

```
1   stop();
2
3   import fl.video.*;
4   import com.greensock.*;
5   import com.greensock.easing.*;
6
7   var thumb_width:Number;
8   var thumb_height:Number;
9   var thumbs_x:Number;
10  var thumbs_y:Number;
11  var video_x:Number;
12  var video_y:Number;
13  var my_videos:XMLList;
14  var my_total:Number;
15
16  var main_container:MovieClip;
17  var thumbs:MovieClip;
18  var titles:Sprite;
19  var my_player:FLVPlayback;
20
21  scrollVideos.alpha = 0;
22
23  var myXMLLoader:URLLoader = new URLLoader();
24  myXMLLoader.load(new URLRequest("playlistVidLib.xml"));
25  myXMLLoader.addEventListener(Event.COMPLETE, processXML);
26
27  function processXML (e:Event):void
28  {
29      var myXML:XML = new XML(e.target.data);
30
31      thumb_width = myXML.@THUMB_WIDTH;
32      thumb_height = myXML.@THUMB_HEIGHT;
33      thumbs_x = myXML.@THUMBS_X;
34      thumbs_y = myXML.@THUMBS_Y;
35      video_x = myXML.@VIDEO_X;
36      video_y = myXML.@VIDEO_Y;
37      my_videos = myXML.VIDEO;
38      my_total = my_videos.length();
39
40      makeContainers();
41      makePlayer();
42  }
43
44  function makeContainers():void{
45      main_container = new MovieClip();
46
47      addChild(main_container);
48
49      thumbs = new MovieClip();
50      thumbs.addEventListener(MouseEvent.CLICK, playVideo);
51      thumbs.addEventListener(MouseEvent.MOUSE_OVER, onOver);
52      thumbs.addEventListener(MouseEvent.MOUSE_OUT, onOut);
53      thumbs.x = thumbs_x;
54      thumbs.y = thumbs_y;
55      thumbs.buttonMode = true;
56      main_container.addChild(thumbs);
57
58      titles = new Sprite();
59      titles.x = thumbs_x;
60      titles.y = thumbs_y;
61      main_container.addChild(titles);
62  }
63
64  function callThumbs():void
65  {
66      for (var i:Number = 0; i < my_total; i++)
67      {
68          var thumb_url = my_videos[i].@THUMB;
69          var thumb_loader = new Loader();
70          thumb_loader.name = i;
71          thumb_loader.load(new URLRequest(thumb_url));
72          thumb_loader.contentLoaderInfo.addEventListener(Event.COMPLETE, thumbLoaded
73          thumb_loader.y = (thumb_height + 10) * i;
74
75          var thumb_title = my_videos[i].@TITLE;
76      }
```

Code Snippet

This is a screenshot of some of the code from the dynamic video player.

The full code is available in the appendix.

Packaging and Print Materials

Early on, I knew that I wanted to create accompanying print materials, but I planned to implement only a CD label and a user guide. However, I was fortunate enough to be able to study independently with typographic expert and graphic design professor Bruce Ian Meader. His expertise and direction not only helped me to improve upon my logo and layouts but also inspired me to create more than just the two print materials mentioned above and to create a poster and branded lesson plans and practice routines.

The first step in creating print materials was to be sure branding matched and flowed nicely from the multimedia elements to the print materials. I used an asymmetrical curve that mimics the flow of water in a dynamic and interesting way on the poster and a slightly tweaked version in the user guide. I chose to design a very simple CD label, but I mocked up about ten possible layouts and, working with Bruce, I chose one that showed the branded pool tiles discussed in the design section and a semi-transparent curved white holder for the text and logo.
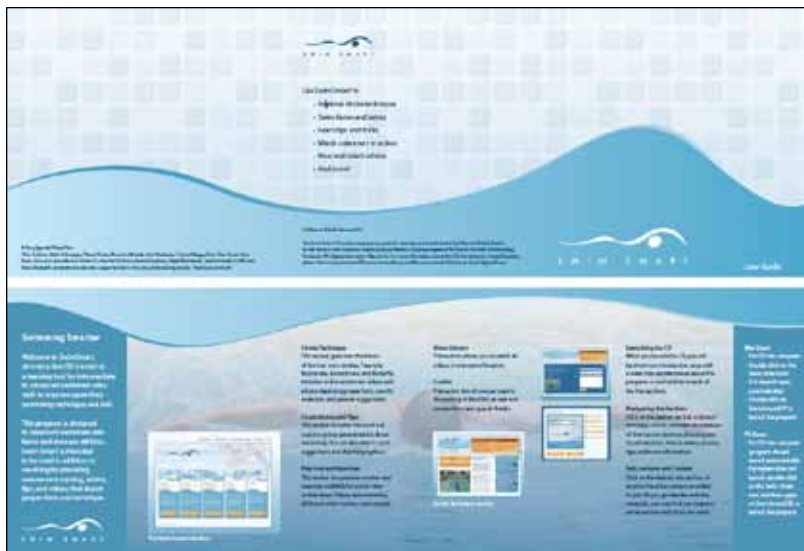
Summary

Technical Issues

For the most part, I did not have too many coding challenges writing the ActionScript or XML that combined all content into the shell. The biggest coding challenge involved unloading and loading videos into the player to play and then stopping them not only when the user switches to another video, but also when the user navigates to another page. In some stages, everything was working but when another page or section was loaded, it would load on top of the playing video, causing the user to continue hearing the video's audio without it being on the screen. There were many constraints I had to think about in terms of what the user might do on a particular page, and a big challenge was being sure that all possible actions would result in a positive experience for the user, causing no problems or "breaks" in the program.

Other areas of the project that created some unforeseen technical issues involved the video shooting. I found that lighting and audio were both challenges that I didn't consider before some of the shoots. The audio in the pool area was not a problem because I used coach commentary on top of the videos, but getting a proper angle on the swimmer was one of the biggest challenges. Also, the equipment certainly comes with a learning curve, and sometimes the problems were "user errors."

Troubleshooting

There were several roadblocks that I encountered during the creation of SwimSmart. This is not necessarily a bad thing, because I learned a great deal about the entire process: researching, planning, writing, shooting, editing, designing, coding, and implementing an instructional multimedia application. That being said, the roadblocks came as incidents that I definitely wasn't expecting. Writing and understanding how to use ActionScript in Flash can be very challenging when a professor, boss, or co-worker isn't guiding you. You must create a plan for what you want to achieve, and understand how the code works to make that happen. Surprisingly, I did not have very many coding challenges when creating this application, and for those challenges I did face, I sought guidance from my fellow classmates, and occasionally, my professors. However, I wrote most of the code with no problems, and I found that my real challenges turned up elsewhere.

When filming someone, especially for an instructional video, a plan must also be written in order to make sure nothing is missed that should be included. However, you cannot implement your plan without counting on other people—the people you are filming—to do what you want them to. One problem I ran into involved one of my swimmers having a panic attack before filming and not going through with the shoot. I had to do some quick thinking since my future plans involved shooting her swim more, as well as interviewing her. I made adjustments and scheduled other swimmers in, but then came the trouble with availability. My swimmers were all involved in other outside activities, their jobs, and more, and it was hard to find a time when both the facilities (pool) and my swimmers were available.

Another obstacle came as a surprise when I tried to shoot coach interviews and advice, outside. Even with a microphone, and on two separate locations, the wind was so loud it was affecting the sound. I moved these shoots inside, and used footage that was not affected by the wind in other areas of SwimSmart. In the future, I would be sure to obtain a windsock, or other device to help cover the microphone and reduce wind noise, but at the time of shooting, I not only did not have access to one but I didn't know they existed. Only after speaking with my advisors after the video shoot I learned that I could have used one to obtain better audio. It was a learning experience for the next time I shoot, and a reminder that knowing everything about your equipment and how it works is extremely important.

I also had problems when shooting the dryland section because the fitness model had a hard time performing the exercises while speaking the instructions. I solved this problem by shooting the model performing the exercises alone, and recording her explaining her actions separately. I combined the two and created an easy-to-understand workout video section for warm-ups and other dryland training.

In the "real world", an application like SwimSmart would be put together by a team of people working together in their various areas of expertise. Because I created the application myself, I wasn't as strong of a videographer as I would have liked the ideal videographer for SwimSmart to be. However, without the experience and problem solving I wouldn't have learned about areas I'd like to improve in, and where I could learn from, or employ, an experienced videographer for future improvements.

Usability

SwimSmart was tested on twelve individuals ranging in age from 13 to 35. I wanted to be sure that the layout, information hierarchy, and design were straightforward enough for young swimmers to understand as well as coaches and other users. It was found that, although some of the older swimmers thought the information contained a lot of material they already knew, they did agree that seeing the swimmers performing the sport in the water, as well as hearing coaches describe common problems and fixes for them, would be beneficial to them if they had the time to work through all the videos. Some feedback I received was that the color orange used in some areas was not readable enough. In response to that feedback, I darkened the color a bit. I also found that users thought the video on the main stroke page was just a static image because they did not notice the text to click on to begin. So I changed the program to automatically play when the user navigates to that particular page. Overall, my usability testing was positive and had a great impact on how I tweaked the final product to be as straightforward and user-friendly as possible. Some positive comments were that the information is clear and is provided in various formats (text, visuals, audio) so that different types of learning styles are accommodated.

I also had my peers, other designers, and graphic design specialists and professors look over the design, branding, and other aspects of the application. I received a lot of useful feedback that I took into consideration to make SwimSmart as best designed as possible.

Conclusion

SwimSmart, as a whole, includes an interactive multimedia CD with videos, audio, animations, and text, which is designed to teach swimmers to improve their stroke technique, a user guide, CD label, printable practice routines and exercises, and posters advertising the product that can be hung in high schools and colleges. The process of creating SwimSmart was lengthy because of all the different types of media involved.

I believe the implementation and output of the SwimSmart program was successful. The goal of SwimSmart was to be a valuable resource to instructors and students, helping to explain and demonstrate the sport of swimming in a non-linear and multi-modal format. Based on reaction to the final product, as well as on usability testing, I am confident that I achieved that goal. The actual implementation, which is explained in detail above, involved conducting a wealth of research, writing code, designing the interface and branding, shooting and editing video and special effects, and combining and burning all materials to a CD that runs automatically when inserted into any computer.

A very important feature of my design for SwimSmart is that it is incredibly easy to modify. In the future, other similar programs could be developed that address and teach or enhance other physical and sports activities. Because the videos included in the application are loaded dynamically into the program using XML, the videos can easily be swapped out in a matter of minutes. Of course, the subject content must be researched, written, and video-taped but, in terms of loading all the content into a shell, it is very easy to implement. I think this is very important for demonstrating that, not only can the concept and design of SwimSmart be implemented, but also its duplication in other content areas is easily achievable.

In the future, I would like expand SwimSmart by filming at a facility that has fewer restrictions and more options for shooting creatively. As mentioned in the troubleshooting section above, it was very difficult to get a good angle on the swimmers with the available equipment. For example, it would be better to set up a tripod and camera on a higher surface in order to shoot the swimmers from above. That kind of enhancement would better enable users to visualize the sport of swimming. I also wonder if other sports could be taught similarly, and what changes or accomodations would need to be made to the SwimSmart application based on different physical activities.

Appendix

Thesis Proposal for the Master of Fine Arts Degree

Rochester Institute of Technology
College of Imaging Arts and Sciences
School of Design
Computer Graphics Design

Title: The Effect of Instructional Multimedia on Improvement in Physical Activity

Submitted by: Rebecca Berent

Date: November 16, 2009

Thesis Committee Approval:

Chief Adviser: Associate Professor Chris Jackson, Computer Graphics Design

_____   _____

Signature of Chief Adviser   Date

Associate Adviser: Visiting Assistant Professor Shaun Foster, Computer Graphics Design

_____   _____

Signature of Associate Adviser   Date

Associate Adviser: Professor Marla Schweppe, Computer Graphics Design

_____   _____

Signature of Associate Adviser   Date

School of Design Chairperson Approval:

Chairperson, School of Design: Patti Lachance

_____   _____

Signature of Chairperson   Date

Thesis Proposal for the Master of Fine Arts Degree

The Effect of Instructional Multimedia on Improvement in Physical Activity: An investigative study of the effects an instructional swimming DVD has on professional swimmers and coaches as compared to traditional training

by Rebecca Berent

The Effect of Instructional Multimedia on Improvement in Physical Activity
An investigative study of the effects an instructional swimming DVD has on professional swimmers and coaches as compared to traditional training

Abstract

The purpose of this study is to determine whether computer graphics design, more specifically, instructional multimedia can be used as a tool to improve physical activity. The final product, an instructional DVD for experienced coaches and swimmers, will prove that instructional multimedia does have an impact on physical activity, and can be used as an effective means for teaching and improving upon physical skills. The finished DVD will include mainly videos and text combined with additional audio, imagery, photographs, icons, and animation. Subjects pulled from the target audience will go through the program, answering a questionaire and evaluating the effectiveness and impact the program had on them. My goal is to determine whether people can improve physical activity by using a computer application, and ultimately to create and sell similar products if it is effective.

Problem Statement

I am building an instructional DVD for experienced swimmers and coaches to find out if physical techniques and skills can be improved by using an interactive computer application as opposed to, or in addition to, traditional training.

Perfecting a sport, like any other repetitive activity, requires practice, encouragement, and assistance. With so many people using computer software to aid in classroom learning, I want to find out if there are benefits to using software to improve upon a physical activity. Swimming has always been a favorite sport of mine, and I was on various swim teams growing up. Swimming, an individual sport, is first a competition against yourself – your best time, and second against other teams and your own teammates. Instead of teamwork to win a race, your skills are yours only, and you do your part as an individual in meets and races in order for your team to win – and winning is based on speed. Because of this, coaches often cannot address every single problem each swimmer might have, and often, poor techniques are missed or not corrected, sometimes because the swimmer is quite fast, regardless of improper technique. I want to find out if there are benefits to using computer software to improve swimming technique in individuals, as well as in a group setting, so I am building an instructional DVD for experienced swimmers and coaches to use both in and out of the classroom.

Thesis Proposal for the Master of Fine Arts Degree

The Effect of Instructional Multimedia on Improvement in Physical Activity: An investigative study of the effects an instructional swimming DVD has on professional swimmers and coaches as compared to traditional training

by Rebecca Berent

I believe that computer graphics should be used to benefit people in any way it can. It has been shown that not everyone learns the same way, and different learning styles often need to be applied to different individuals. I feel that this is the same with physical activity. Providing a DVD with many different options for learning to improve upon a skill that the users already possess, will force them to learn to look at swimming, their own body movements and strokes, in a different way, hopefully improving their performance in ways they never thought were possible or necessary.

Nothing like this exists yet, as a standalone application, nor as a website. There are a few reputable brands of instructional swimming DVDs that show technique through audio and video. The DVDs are not searchable, and not interactive either, forcing the user to go through all of the content without being able to isolate problem areas. These DVDs are also extremely in-depth, and one stroke or specific technique is covered on each DVD. This means an individual must purchase multiple volumes in order to address problems with each stroke, and even more volumes to help with turning, starting, breathing, etc. There are also free several-minute long Youtube.com videos that address specific areas of swimming, but these are stand-alone short video clips that each need to be sought out separately (see the Competition section.)

My DVD will include video clips starring and explained by three professional swimmers, Chrystal Marcotte, Sarah Kimball, and Karl Dobosz. The video clips include the correct way to swim each stroke (freestyle, backstroke, breaststroke, butterfly) and all techniques associated with swimming (turns, starts, breathing, finishes, goggle fitting, kickboard workouts, flipper workouts, brick workouts, out-of-water workouts, etc.) Other videos are interviews of four professional coaches, Doug Tobey, Karl Dobosz, Sarah's Aunt and Sarah's Coach. The interviews will be edited and the shorter videos will be clips of advice accompanied by charts, lists, imagery, etc. that will be featured wherever necessary – either as helpful tips, or as primary content. Users can also view the full interviews with the coaches in the "credits" section of the application. In addition to videos, the DVD will include short blurbs of text, clearly stated swim tips, photographs that I take or that I choose to purchase, very short transition animations, charts, graphs, etc. The DVD will also include a specific video for each stroke that shows what muscles are being used to do it, and what the best out-of-water exercises are for that particular stroke.

With input from many swimming professionals, coaches, swimmers, books, magazines, the Internet, and my own knowledge of the subject, I will organize the information into the most concise and clear way that I can (see flowchart.)

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by Rebecca Berent

Survey of Literature

Swimming Books

The Triathlete's Training Bible
by Joe Friel
VeloPress; Third Edition, February 2009

This book is not just intended for swimming, as it says in the title, but it is still a great guide for setting yourself up for regular workouts, preparing for swim meets and other races, and learning basic technique for swimming as fast as you possibly can. Because this book is intended for people who are competing in a triathlon (or the like), it is a great resource for learning to go fast. Although stroke technique is emphasized less, streamlining, and other important tricks to going faster in the water are covered, as well as how to train, what to eat, how to improve body composition, breathing techniques, and more. This book will be extremely helpful to the racing section of my DVD, as well as contributing to the content and pop-up facts about swimming.

Complete Conditioning for Swimming
by David Salo
Human Kinetics, June 2008

This book contains everything an advanced swimmer or coach needs to know in perfecting a swimmer's technique. From warming up, to tailoring strokes, diving and starting, to flip-turns and cool-down, there is a wealth of information here that will be part of the basis of my content. Because the book is written for an already experienced swimmer, it is similar to the way I want to present content for my DVD.

Fitness Swimming
by Emmett Hines
Human Kinetics, June 2008

This book starts from the ground up in terms of learning to swim but it moves quickly and covers all areas of swimming, from the beginner to the advanced. This book provides workouts that are broken down by the goal of the training. There is speed training, strength training, stroke enhancement, etc. I will use this book for the content in parts of my workout suggestions and training programs.

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Total Immersion: The Revolutionary Way To Swim Better, Faster, and Easier
by Terry Laughlin
Fireside, January 2004

This book demonstrates how to perfect swim performance and shows the correct body positions to enhance stroke technique. The book includes drills that help swimmers strengthen their bodies correctly – both in and out of the water – along with visuals that help in perfecting strokes. This will be an important contributor to my project for both the actual content, but also for the special tips that will pop up throughout. This book will be especially helpful because it offers alternatives to the traditional way of learning to swim, encouraging technique over speed. Although this can be seen as being counter productive, it generally leads to more experienced swimmers in the long run.

The Fit Swimmer: 120 Workouts & Training Tips
by Marianne Brems
Human Kinetics, October 1994

This book gives a very detailed explanation of how to coach swimmers. It is filled with tips and techniques for improving skill. There are also important sections that explain how to teach or correct certain common problems swimmers encounter. This ranges from lazy ankles, to wrong breathing methods, and more. This book is aimed towards swim coaches and teachers. I will use this book to learn more details about competitive swimming, along with ideas for pop-up tips in my application.

The Fit Swimmer: 120 Workouts & Training Tips
by Marianne Brems
McGraw-Hill, March 1984

Although this book is over 25 years old, it still contains valuable information about swimming, how to use various equipment and out-of-water stretches to improve swim technique. Also covered is, of course, swimming itself, but it is presented as a grouping of tips on how to swim better and faster and reaching beyond your personal goals. This book may be helpful for part of the content on my DVD, but some of the methods are not sophisticated enough for the advanced swimmers who will be using the application.

Thesis Proposal for the Master of Fine Arts Degree

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Swimming Contacts

Karl Dobosz
Professional swimmer (1990 – 2006) Swim coach (2005 – present)

Karl has been swimming since he was very young and currently still holds 5 top records at his old high school where he graduated ten years ago. He is now head swim coach of the boys' team at Brighton High School and has been assistant coaching since college. When he was younger, he had the best stroke technique in the district and was regarded as one of the fastest swimmers in his age range. He will be the source of a lot of information, as well as providing insight as both a swimmer and a coach.

Doug Tobey
Swim coach (1982 – present)
Niagara Falls Saints, MCC Mavericks, Brighton High School

Doug will be the source of a lot of my professional information regarding swimming and coaching practices. I will use his coaching methods as one idea of how to run a practice. I will also interview him and use his commentary on the DVD in the videos regarding good stroke technique, and more.

Carrie Kimball
Swim coach (1975 – present)

Liz Whicter
Swim Coach

Chrystal Marcotte
Swimmer

Sarah Kimball
Swimmer

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by Rebecca Berent

Swimming Websites/Electronic Materials

Swimming on About.com, 2009
Mat Luebbers (and guest writers)
http://swimming.about.com/
September 19, 2009

This is an all-inclusive section of about.com that explores the sport of swimming. The intended audience for this content is swimmers, coaches, and anyone who wishes to learn or improve their swimming and can read and follow directions online. Among the many topics covered on this site, one can learn about stretching, turning, all different stroke techniques, breathing, medleys, practices, common swimming problems, coach direction, and more. This is a resource I will use in developing the content for the DVD.

Swimming on WonderHowTo.com, 2009
http://www.wonderhowto.com/how-to/video/how-to-do-hand-technique-drills-to-im-prove-swim-stroke-skills-251986/
September 20, 2009

Similar to About.com in that it is a site where many topics are addressed, WonderHowTo.com has a section devoted to swimming. Different from About.com, however, this site has video tutorials that teach the topic of interest. This site is aimed at any age group that desires to learn to swim or become better because reading is not required to learn and view the content. This is going to be a very valuable site for me in the future so I can learn the best technique for teaching and enhancing skill technique through video. I plan to watch the angles and distance at which scenes are shot to determine if this best solves the problem of teaching via video.

Swimming on Learn4Good.com, 2008
Learn4Good Net
http://www.learn4good.com/howto/learning_to_swim.htm
September 19, 2009

Another site about many topics has a great section on swimming. This site breaks down the strokes – teaching technique on how to do each individual stroke and get the most out of it. The most interesting part of the site is the way it breaks down movement into leg and arm movement, and explains in detail when each series of movements should occur. This information will be valid in the content of the DVD.

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Swimming on Sportsvideos.com, 2004
http://www.sportvideos.com/products.asp?catID=92
September 19, 2009

This site provides instructional DVDs for learning to swim. Although I am not able to preview the content on the DVD, I would like to obtain them so I can learn the most effective way to integrate video into my application. Although there are many clips on Youtube, and other sites like it, these are complete DVDs going over every detail of each stroke. I might be able to use these to help with both the way to capture video (angles, lighting, etc.), as well as what the most effective actions are to obtain on video.

E-Learning Books

e-Learning by Design
by William Horton
Pfeiffer, July 2006

This book provides guidance for making the best decisions for effective e-learning. It covers how to engage users by providing fun, interactive activities. It also teaches how to create learning games, simulations, tests, and assessments online. This book is targeted towards instructional trainers and educators who want to take learning to the next level. It will likely be helpful to me in making certain decisions about how content should be displayed, taught, presented, covered, etc.

Designing Web-Based Training: How to Teach Anyone Anything Anywhere Anytime
by William Horton
Wiley, February 2000

This book discusses the process for building a multimedia application by considering the different approaches, framework, structure, and processes for various types of learning. The book asserts that it is important to know how to teach what you are teaching. There are many different methods for distributing information through e-learning, and depending on which approach is taken, different results will be obtained. The book also contains troubleshooting information for technology hurdles, as well as distribution, pushing boundaries, and more information about creating and implementing cutting edge applications that work the way they're supposed to. The book is aimed towards college and graduate students, as well as people in the industry who want to learn more about the process of creating an effective teaching solution.

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Multimedia-Based Instructional Design : Computer-Based
Training, Web-Based Training, and Distance Learning
by William W. Lee
Pfeiffer, April 2000

This book is a more technical view at multimedia-based training focusing on the planning, structuring, and evaluation of the project as much as they touch upon the actual development. This book is aimed towards college and graduate students, professors, and professionals in the industry who wish to create a multimedia project most efficiently. I will use this book for the planning of the project, including the set-up of my schedule for the duration of the project.

How People Learn: Brain, Mind, Experience, and School
by The Committee on Developments in the Science of Learning
National Academies Press, September 2000

This book interprets how different people learn and which teaching methods are the most successful in which areas of study. This book is aimed at educators who want to know the most effective way people learn, and to developers of learning materials. This book will be helpful in addressing the best way to teach the information in the application.

The E-Learning Handbook: A Comprehensive Guide to Online Learning
by Saul Carliner
Pfeiffer, April 2008

This book goes into the details and in-depth information about what e-learning is, how it is effective, and what is the best way to use it. A large section of the book is devoted to technology issues, something that I will need to do a lot of research on before beginning to develop the application. This book is aimed at designers and developers who are beginning an e-learning project. It covers all groundwork that must be addressed before beginning the project, and then information about how to solve problems as they arise.

Flash CS4: The Missing Manual
by Chris Grover
Pogue Press, December 2008

This book is a complete guide to Flash CS4 and covers all new aspects to Flash, as well as the traditional methods that have been carried over. This book is aimed towards

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Flash designers and students. I will need this book for the duration of the project so I can troubleshoot Flash and Actionscript problems as they arise, and also so I can create the content in the way I intend to, with a comprehensive guide to use along the way.

Designing Online Learning with Flash
by David Richard Moore
Pfeiffer, January 2009

This book provides users with a model of learning that is appropriate for online learning. The book teaches how to integrate Flash applications with the content that needs to be taught, and the most effective way to do so. The book covers how to teach ideas, facts, concepts, principles, and procedures using a commonly used teaching theory. This book is aimed towards designers and trainers developing e-learning applications. Each section of the book presents a teaching problem, and the best way the problem can be addressed and demonstrated using Flash.

Designing Online Learning with Flash
by David Richard Moore
Pfeiffer, January 2009

This book covers designing online materials using Flash. This will be particularly helpful to me because my project is all Flash-based. This book gives designers not only an understanding of how to develop functional online content, but also how to integrate learning into a Flash interface. The book is aimed towards Flash and multimedia designers.

E-Learning Websites/Electronic Materials

Learning About Instructional Design from Video Games
Libraryvoice.com, 2009
http://libraryvoice.com/instruction/learning-about-instructional-design-from-video-games/
September 19, 2009

This is an article that encourages readers to pull instructional design elements from video games in order to most effectively teach content. This is itself a great start for a discussion, but also plays directly into the DVD's goal: to be a fun, effective way of learning to improve swim technique while keeping the users focus and attention. I will use this article to reference different types of video games and how they can be interpreted

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and used to express swimming techniques.

Friends of Ed
Friendsofed.com, 2009
http://www.friendsofed.com/
September 21, 2009

This site will help me throughout the process if I have questions, need downloads, or if I want to get tutorials for creating specific animations or movements while building the program in Flash.

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Project Description

Design

The interface will be designed using Adobe Illustrator and Photoshop. I want to create a very simple, yet modern feel for the interface, using whites and light greys/silvers paired with a bright, water-like blue. A burnt orange will be used for certain accents, but the majority of the content will be in blue and white/grey:

main colors   accent color
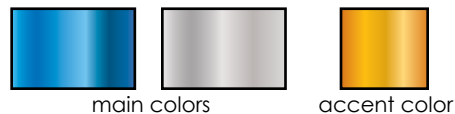
I plan to mimic a shadowbox/lightbox application for the web using Flash that opens a pop-up window and darkens the background for the display of all information in a particular section. For example, when a video pops up, it will lay on top of the other content and information behind it in a pop-up window with a close button. The videos and other content on the DVD will all be movie clips that play on top of the section they are in. This is how a video might look:

The design of the video pages is very similar to that of Youtube. The video plays, with options to play, pause, seek, stop, full screen, etc. and to the right of the video are two or three related video clips that the user might also want to check out. This is going to be hard-coded ahead of time, however, it will allow the user to feel as if the DVD is catered to him or her by offering related videos to check out.

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Sketches / Layout Ideas

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Subjects and Participants

The application is intended for use by coaches, advanced swimmers, professional swimmers, triathletes, swim teams, and anyone who wants to learn expert stroke and swimming technique and learn additional tips and tricks along the way. The application is designed for use on a computer, which can be used by individuals, or shared with groups on a projector screen.

Participants in the application are the coaches and swimmers interviewed and/or videotaped and used in the project. The coaches involved, Doug Tobey, Anne Kimball, and Karl Dobosz are sources of information for sections of the project, but also provide the content directly through videotaped tips, tricks, and advice. The swimmers involved provide their talent by swimming and demonstrating different aspects of swimming. One swimmer, Chrystal Marcotte, will be both demonstrating stroke technique, as well as conducting all out-of-water stretching and workout talent. Although I will write the content, she will act as the "teacher" for the majority of tasks throughout the application by speaking as well as acting out the exercise. Users can view the full interviews with the coaches in the "credits" or "extras" section of the application.

The other swimmers, Sarah Kimball and Karl Dobosz, along with Chrystal will be video taped doing each stroke (freestyle, backstroke, breaststroke, butterfly) to show the differences in each swimmer's approach. Each swimmer will also perform turns, starts, finishes, workouts both in and out of the water, and other techniques (kickboard workouts, flipper workouts, other equipment demos, etc.) The swimmers will also stand still with their arms and legs spread so that I can use After Effects to show and isolate muscles that are used for particular strokes.

Usability testing will be done throughout the duration of the project completion. I will have the swimmers and coaches involved in the project, along with three additional coaches and at least three additional swimmers give me feedback on the overall design, layout, usability, structure, information, content, and more.

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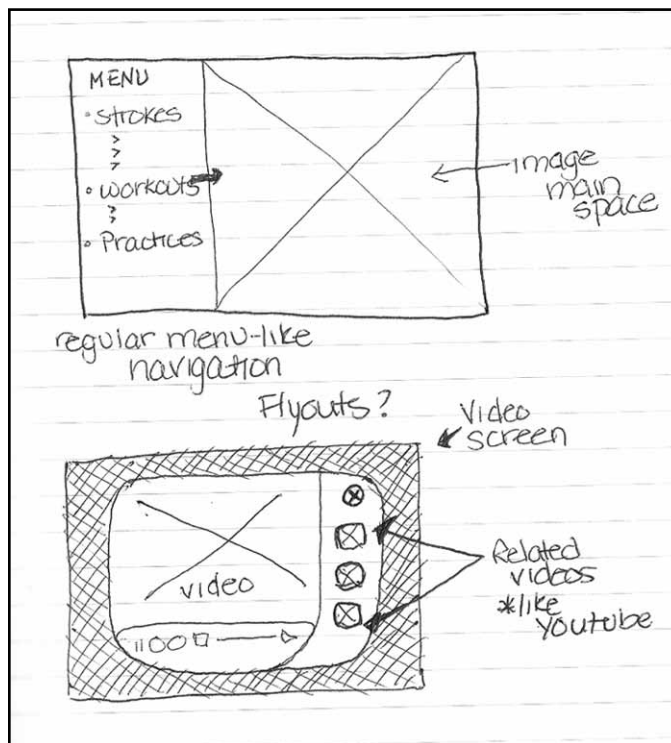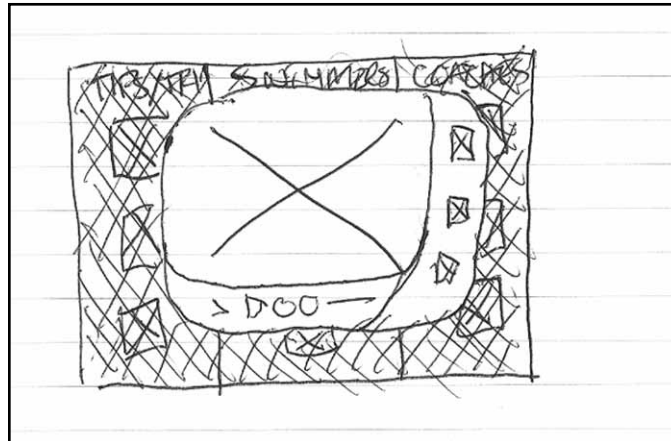
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Sample Interview Questions (Coaches)

1. How long have you been coaching?
2. Were you a swimmer before you became a coach?
3. What teams do you coach currently? What teams have you coached in the past?
4. How do you conduct practices? Give an overview of your normal routine.
5. Do you use water equipment? How?
6. How do you run practices around the [swim] clock/timer?
7. Do you encourage out-of-water exercises? Which?
8. Do you demonstrate out-of-water exercises? How?
9. What tips would you give someone struggling with weak starts/kick/arms/turns/breathing/etc. for each stroke?
   a) Breaststroke
   b) Backstroke
   c) Freestyle
   d) Butterfly
10. What do you feel are the fundamentals to swimming?
11. What do you push your swimmers to do most often?
12. How do you push your weaker swimmers, and what encouragement do you give?
13. How would you describe to someone how to be the best possible coach?
14. What equipment do you encourage your swimmers to buy and use?
15. How often do you conduct practices?
16. How often do you expect your best swimmers to practice?
17. Do you have your swimmers on certain diets?
18. What do you think an ideal best time would be for each stroke?
    a) Breaststroke
    b) Backstroke
    c) Freestyle
    d) Butterfly
19. What are the best exercises to strengthen each stroke?
    a) Breaststroke
    b) Backstroke
    c) Freestyle
    d) Butterfly
20. What is the best advice you can give to new or aspiring swim coaches?
21. What is your favorite thing about coaching?
22. What is your least favorite thing about coaching?
23. Any other advice you wish to give?

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Computer Graphics

The application will be built using primarily Flash and set up as a stand-alone application on DVD that autoruns on a PC, or with a double-click on a Mac. The content will be recorded using the video cameras available to CGD grad students, and edited using iMovie, Adobe Premier, and After Effects. I will either take or purchase photographs, and create additional graphics, backgrounds, buttons, etc. using Adobe Photoshop, Illustrator, and Flash. I will record additional audio (not from video) using the CGD Sound booth as well as Adobe Soundbooth to process the audio. All of the pieces will be compiled in Flash, and transitions, buttons, and all interactions and movement will be created in Flash and Actionscript. Flash and Actionscript will be used to create the menu system, which will be a floating, movable, collapsible menu, the videos and their controls, various clicks, rollovers, and transitions, and an animation of how the body should move for each stroke.

In addition, I will provide a section for coaches to keep track of their swimmers' best times and other information. The form will be available for the user each time they run the program, as long as they open it on the same computer (it will be saved on the user's hard drive.) This will allow coaches to track their swimmers' progress over time, and user suggestions from the program to improve aspects of the swimmers' techniques. In addition to tracking scores, suggestions for improvement in several common, yet specific, areas of swimming will be discussed on video by the coaches interviewed.

Procedure

I will begin this project by setting up the interviews and swimming schedules with the coaches and swimmers, and videotaping them to get all of the video content I need (see below.) I will provide the coaches with questions prior to the interviews so they can prepare the best possible answers, and the swimmers will be informed ahead of time as to what is expected of them. Coaches will be present when I videotape the swimmers in order to be sure I capture the best takes on camera and maybe even some commentary by the coaches to go along with it. Swimmers will be able to warm up, which I will also capture on video as part of a background element for coach inverviews. Here is a list of all footage needed:

- Strokes
    - · Breaststroke
    - · Backstroke
    - · Freestyle

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- · Butterfly
- Starts
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Turns
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Water Exercises
  - · Practice Ideas (for coaches)
  - · Flipper exercises
  - · Kickboard exercises
  - · Brick exercises
- Out of water exercises
  - · Stretches
  - · Workouts
  - · Equipment workouts
  - · Pilates ball
  - · Weights
  - · Bands
- Coach Interviews
  - · Doug Tobey
  - · Sarah's Aunt
  - · Sarah's Coach
  - · Karl Dobosz
- Swimmer Interviews
  - · Sarah Kimball
  - · Chrystal Marcotte

After all video footage is gathered, I will begin to edit the videos and create a variety of smaller video clips for the application:

- Stroke overviews
  - · Breaststroke
  - · Backstroke

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- · Freestyle
- · Butterfly
- · All strokes
- Breathing techniques
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Kicks
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Arms and upper body movement
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Strength training
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Turns
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Starts
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- Practice Ideas/suggestions
  - · Doug Tobey
  - · Sarah's Aunt
  - · Sarah's Coach

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- · Karl Dobosz
- In-water exercises
- Out-of-water exercises
    - · Stroke specific
        - · Breaststroke
        - · Backstroke
        - · Freestyle
        - · Butterfly
    - · Full body exercises
    - · Pilates ball, stretch band, and weight exercises
    - · Targeting specific muscles for starts, breathing, etc.
    - · Muscle isolation with full body shots
- Tips and Tricks 1
    - · Featuring clips from coach interviews, etc.
- Tips and Tricks 2
    - · Featuring clips from coach interviews, etc.
- Tips and Tricks 3
    - · Featuring clips from coach interviews, etc.
- Coach interviews
    - · Doug Tobey
    - · Sarah's Aunt
    - · Sarah's Coach
    - · Karl Dobosz
- Swimmer input
    - · Chrystal Marcotte
    - · Sarah Kimball

After all videos have been edited into smaller clips, I will begin writing the text content for the DVD, based on information from books, websites, and the interviews with the coaches and swimmers. Once all the content is completely written out and referenced, I will import everything into my Flash interface and begin organizing it according to where it belongs in this flow chart:

Splash screen with links to pages (Stroke Technique, Starts & Turns, Strength & Improvement, Tips & Tricks, All Videos, Credits)

- Stroke Technique Page
    - · Contains text tips for improving stroke techniques

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- · Breaststroke
    - · Overview, Starts, Turns, Kick, Arms, Breathing
- · Backstroke
    - · Overview, Starts, Turns, Kick, Arms, Breathing
- · Freestyle
    - · Overview, Starts, Turns, Kick, Arms, Breathing
- · Butterfly
    - · Overview, Starts, Turns, Kick, Arms, Breathing
- · Contains videos for improving stroke technique with out-of-water workouts
    - · Stroke specific
        - · Breaststroke
        - · Backstroke
        - · Freestyle
        - · Butterfly
    - · Full body exercises
    - · Pilates ball, stretch band, and weight exercises
    - · Targeting specific muscles for starts, breathing
    - · Contains links to a page for each stroke: Breaststroke, Backstroke, Freestyle, Butterfly
        - · Breaststroke Page
            - · Breaststroke overview (video)
            - · Breaststroke start (video)
            - · Breaststroke turn (video)
            - · Breaststroke tips (video)
            - · Breaststroke workouts – in water (video)
            - · Breaststroke workouts – out of water (video)
            - · Brief Coach commentary on Breaststroke (video)
            - · Breaststroke photos
            - · Breaststroke tips (pop-out tip box)
            - · Breaststroke animation of arms and legs – top view (flash animation)
        - · Backstroke Page
            - · Backstroke overview (video)
            - · Backstroke start (video)
            - · Backstroke turn (video)
            - · Backstroke tips (video)
            - · Backstroke workouts – in water (video)
            - · Backstroke workouts – out of water (video)
            - · Brief Coach commentary on Backstroke (video)

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- · Backstroke photos
- · Backstroke tips (pop-out tip box)
- · Backstroke animation of arms and legs – top view (flash animation)
- · Freestyle Page
    - · Freestyle overview (video)
    - · Freestyle start (video)
    - · Freestyle turn (video)
    - · Freestyle tips (video)
    - · Freestyle workouts – in water (video)
    - · Freestyle workouts – out of water (video)
    - · Brief Coach commentary on Freestyle (video)
    - · Freestyle photos
    - · Freestyle tips (pop-out tip box)
    - · Freestyle animation of arms and legs – top view (flash animation)
- · Butterfly Page
    - · Butterfly (video)
    - · Butterfly start (video)
    - · Butterfly turn (video)
    - · Butterfly tips (video)
    - · Butterfly workouts – in water (video)
    - · Butterfly workouts – out of water (video)
    - · Brief Coach commentary on Butterfly (video)
    - · Butterfly photos
    - · Butterfly tips (pop-out tip box)
    - · Butterfly animation of arms and legs – top view (flash animation)
- ● Starts & Turns Page
    - · Contains text tips for helping with starts
        - · Breaststroke
        - · Backstroke
        - · Freestyle
        - · Butterfly
    - · Contains text tips for helping with turns
        - · Breaststroke
        - · Backstroke
        - · Freestyle
        - · Butterfly
    - · Contains VIDEO for helping with starts

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- · Breaststroke
- · Backstroke
- · Freestyle
- · Butterfly
- · Contains VIDEO for helping with turns
  - · Breaststroke
  - · Backstroke
  - · Freestyle
  - · Butterfly
- · Contains photos of starts and turns for each stroke
- Strength and Improvement Page
  - · Contains practice routine videos
  - · Contains in-water exercise videos
  - · Contains out-of-water exercise videos
  - · Emphasis on muscle isolation (After Effects)
  - · Contains coach commentaries for improvement
  - · Contains text tips for stretching, eating right, etc.
  - · Contains text tips for ideal body weight – BMI information for swimmers
  - · Contains text, photo, and video tips for practicing – extra drag on suits, etc.
  - · Contains photos of several activities
  - · Contains information about contacting local swim clubs, teams, coaches, etc.
- Tips and Tricks Page
  - · Contains text and video tips for everything
  - · Contains photos of several activities
  - · Contains all coach suggestions
- All Videos Page
  - · Contains a list of all videos organized by subject/stroke
  - · Contains all interview videos - both edited and complete
- Credits Page
  - · Give credit to sources
  - · Contact information for me
  - · Short bios of coaches and swimmers

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Technology

Mac or PC computer

Desktop or Laptop (possibly Kiosk)

Operating Systems: Windows XP/Vista/7, Mac OSX and greater

Computer accessories: Sound, Internet (not necessary), Printer (not necessary)

Flash Player 10

Current Competition

Sports Nation Instructional Videos
http://www.sportsnationvideo.com/swimming.html?gclid=CMbZ69eGrp0CFQRM5QodFQg8jw

SwimOutlet.com
http://www.swimoutlet.com/SearchResults.asp?Cat=248&gclid=CN3qjvmGrp0CFUdM5QodCDmYiQ

Go Swim DVD Series
http://www.amazon.com/s/ref=nb_ss?url=search-alias%3Dtoys-and-games&field-keywords=Go+Swim&x=0&y=0

What makes my application different from existing swimming DVDs is the fact that interaction is required for participation. Content is split up and users choose their own course of action - they are not just passive recipients.

Users will be able to navigate to pages tailored towards improving strokes, turns, starts, practice routines, and more. Videos can be played and controlled, tips are activated by clicks and pop-ups appear on the screen when that the user can explore. There will be links to other areas of the application, as well as web links providing important information where necessary. There will be printable practice and lesson plans for coaches or swimmers who want to try something different. The application will be designed for active teaching and learning, in a classroom, alone, or some combination of both. Coaches may decide to use the program in the classroom to formulate and assist in the way they currently coach by adopting ideas and tips, tricks, and practices demonstrated in videos, photographs, and text. Students may choose to use the DVD independently to improve their own technique in strokes, turns, starts, and more. Out of water exercises are also provided, described, and demonstrated, giving inspiration to coaches and individuals alike to start training out of the water as well. Workouts are catered to stroke improvement, and demonstrations of the muscles used in each stroke are emphasized and highlighted. Most videos contain not only the video chosen by the user, but, like Youtube, a few links to related videos that the user might find helpful are provided. This gives the application a personal nature providing "suggested" links to other useful information.

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Target Audience

Male / Female: Both
Age: 14 and Up
Educational Level: Any
Motivational Level: High
Experience with Thesis Subject Matter: High

Persona 1

Samantha Swimmer

Age: 16 years-old

Experience: Samantha has been swimming for 8 years on various different swim teams. Currently she is on her high school swim team, and a club team at a local community college. She is hoping to be noticed by top college swim coaches and get a scholarship to the college of her choice. Sarah's best stroke is backstroke. She excells at freestyle and breaststroke too, but she struggles with butterfly and she sometimes has trouble with her starts off the block.

Reason for using the DVD: Samantha's coaches have been working with her to perfect her strokes over the years but her parents think she might benefit from seeing examples of correct stroke technique demonstrated by other professional swimmers and coaches. The tips that are offered on the DVD cater towards common problems that swimmers experience, so Sarah hopes she will be able to identify with, and understand her short-comings so she can perfect her stroke and starting techniques.

Expectations: Samantha assumes that the swimmers and coaches on the DVD are giving her correct information. She also expects that the correct "swimming jargon" will be used throughout - she does not expect to be taught swimming from scratch or being spoken to like she's a beginner. She wants to be immediately immersed in the content, and does not want to bother with flashy screens and extra fluff. However, she does not want to be bombarded with heavy text, so she expects points will be made clear and concise to her through text, imagery, videos, audio, and diagrams. She also hopes that it will be easy to find exactly what she's looking for and not have to spend too much time figuring out where to find answers.

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Persona 2

Corey Coach

Age: 28 years-old

Experience: Corey has been swimming since he was very young for various swim teams including high school, club teams, and college. He still enjoys swimming regularly, but he also coaches his town's high school swim team. He thinks his own stroke technique is fine, but he wants to encourage and improve his students' techniques to have the strongest team in the district.

Reason for using the DVD: Corey wants to use the DVD for several purposes. He wants to learn the perspective of the coaches on the DVD to learn any tips or tricks he could use to help his swimmers. He also needs some help with a specific student who has potential but a weak kick, and hopes the DVD has tips dedicated to specific and common problems. Corey also wants to project some of the content on the wall in the locker room before practice to show his students some short videos of best technique, and point out areas where his students could improve. Finally, Corey wants to see if he can learn from some of the swimmers on the DVD himself to make himself stronger too.

Expectations: Corey assumes the content will be thorough and correct. He wants to find things easily, and he wants to make sure that he agrees with most of the overall content before sharing it with his students. He hopes the videos are high-quality and short, allowing him to display the videos for his students so that they can learn from them and not get bored.

Implications of the Research

The outcome of creating the DVD and studying the effects it has on the users will hopefully show that computer graphics, and more importantly, instructional computer applications have a positive effect on improving a physical activity. This will allow others, as well as me, to create more of these sport technique DVDs in a similar way and market them to coaches, players, teachers, parents, and students. Also, users will now be able to learn and improve on physical techniques in ways they couldn't before – sitting at their desks.

Budget

Admission to the RIT Swimming Pool - *passes - $5 each*
(6 people in addition to myself on at least 3 separate occasions)
6 x $5 = $30
3 x $30 = **$90**

Thesis Proposal for the Master of Fine Arts Degree

The Effect of Instructional Multimedia on Improvement in Physical Activity: An investigative study of the effects an instructional swimming DVD has on professional swimmers and coaches as compared to traditional training

by Rebecca Berent

* It is possible that I will be able to arrange a deal for admission, but I am
  prepared to pay for each person each time I need to film in the pool area

Printing copies of my thesis: **$30**

Printing DVD labels, covers, packaging for a total of 10 DVDs: **$60**

Fee for entering/submitting the DVD to contests: *projected $100*

Total expected expenses: **$180 - $280**

Marketing Plan

I plan to submit my work to various competitive organizations to showcase and hopefully win awards for my work. I also plan to meet with coaches from districts in Rochester, and offer the temporary or permanent use of my DVDs for their students. If the DVD proves to work well, I plan to market my product using the web, as well as print media advertising.

Software and Hardware Requirements

- Macintosh G5
- IBM Compatible PC with at least a Pentium IV processor
- Windows XP, VISTA or 7
- 500 MB free disk space and 128 MB main memory

Timeline

See timeline file.

Thesis Timeline
by Rebecca Berent

The Effect of Instructional Multimedia on Improvement in Physical Activity

An investigative study of the effects an instructional swimming DVD has on professional swimmers and coaches as compared to traditional training

Thesis Show - May ??, 2010

MONTHS	October	November	December	January	February	March	April	May	Graduation
DATES	5-11, 12-18	19-25, 26-1, 2-8, 9-15, 16-22	23-29, 30-6, 7-13, 14-20, 21-27	28-3, 4-10, 11-17, 18-24	25-31, 1-7, 8-14, 15-21	22-28, 1-7, 8-14, 15-21	22-28, 29-4, 5-11, 12-18	19-25, 26-2, 3-9, 10-16, 17-23	

Quarter markers:
End of Fall Quarter · Mid Quarter · End of Winter Quarter · Thesis Defense (April 16, 17 2008) · Graduation

Timeline tasks:
- Document Project
- Literature Review
- Research Content
- Final Proposal
- Finalize Committee
- Develop Content Outline
- Create Storyboards for videtaping
- Videotape Swimmers/Coaches
- Develop Working Prototype
- Flow Chart
- Write Abstract
- Thesis Web site
- Testing/Feedback
- Edit Video & Create all additional content
- Complete Beta Version of Project
- Committee Meeting
- Committee Meeting
- Committee Meeting
- Committee Meeting
- Defense Prep
- Finish Final Project
- Show Prep
- Thesis Report
- Report Revisions
- Publish Report
- Committee Meeting

Milestones:
- Proposal accepted
- Flow chart finished
- Web site started
- 1st committee meeting
- Content finalized
- Storyboards done
- 2nd committee meeting
- 1st prototype done
- 3rd committee meeting
- Pass thesis defense
- Beta prototype done
- 4th committee meeting
- Complete final project
- Thesis report online
- Last committee meeting
- Thesis show
- Graduation

Appendix

Packaging

The following CD label and booklet accompany each copy of SwimSmart.

They were created using Adobe Illustrator, Photoshop, and InDesign.

Swim Smart was designed for swimmers by a swimmer to help you:

- Improve stroke technique
- Swim faster and better
- Learn tips and tricks
- Watch swimmers in action
- Hear real coach advice
- And more!

Swimming Smarter

Welcome to SwimSmart, an interactive CD created as a learning tool for intermediate to advanced swimmers who wish to improve upon their swimming technique and skill.

This program is designed to transform swimmers into faster and stronger athletes. Swim Smart is intended to be used in addition to coaching by providing one-on-one training, advice, tips, and videos that depict proper form and technique.

Stroke Technique

This section goes over the basics of the 4 main strokes; Freestyle, Backstroke, Breaststroke, and Butterfly. Included in this section are videos and photos depicting proper form, specific workouts, and general suggestions.

Coach Advice and Tips

This section includes videos of real coaches giving general advice about swimming. You can also watch and learn coach biographies.

Practices and Exercises

This section has practice routines and exercises available for you to view or download. Videos demonstrating skills and other routines are included.

Credits

This section lists all sources used in the making of this DVD, as well as a contact form and special thanks.

Video Library

This section allows you to watch all videos in one central location. This is especially helpful for second time users who know exactly which video or training exercise they want.

Launching the CD

When you launch the CD, you will be shown an introduction page with a video that explains more about the program, as well as links to each of the five sections.

Navigating the Sections

Click on the desired section to launch that page, which contains an overview of that section, links to videos, photos, tips, and more information.

Sub-Sections and Content

Click on the desired sub-section, or explore the other content provided to you. As you get familiar with the materials, you may find and frequent same sections each time you use it.

Mac Users

Put the CD into your computer and the program should launch automatically on your screen. If it does not, double-click on the Swim Smart icon, and then double-click the EXE to launch the program.

PC Users

Put the CD into your computer and the program should launch automatically on your screen. If it does not, double-click on the Swim Smart icon, and then double-click the EXE to launch the program.

Additional Print Materials

The following poster and practice routine are two examples of print materials that were created to enhance SwimSmart. The practice routines are available to download and print from the "Practice and Exercise" section of the SwimSmart application. The poster was created to hang in local high schools and gyms promoting a free copy of SwimSmart for those who respond.

Practice Routine 1 (90 minutes)

All drill specifics are covered in the "Exercises" sub-section of the "Practice Routines and Exercises" section of Swim Smart.

Warm-up

Have swimmers play a five-minute game of underwater tag to mix things up a bit. It makes practice fun and gets swimmers into the water and moving their muscles the way a traditional warm-up would. Follow up with a 10-minute traditional warm-up to raise the heart rate and warm-up the muscles futher.

The Workout

- *400 meters the stroke of your choice*
- *8 sets of 50 meters stroke of your choice* doing one of the following drills:
    - FREESTYLE: Fingertip Drag Drill
    - BACKSTROKE: Fingertip Drag Drill
    - BREASTSTROKE: Fingertip Drag Drill
    - BUTTERFLY: Fingertip Drag Drill
- *6 sets of 75 meters stroke of your choice* using only your arms. You may use a plastic buoy between your legs if you'd like.
- *8 sets of 50 meters stroke of your choice* using only your legs (focus on kicks.) You may use a kickboard if you wish, or flippers for added resistance.
- *4 sets of 25 meters freestyle* focusing on speed.
- *3 sets of 100 meters breaststroke* (switch up the choice of stroke everyday)
- *3 sets of 100 meters IMs* focusing on precision and technique.
- *3 sets of 100 meters freestyle* going at a moderate pace for the first 100, faster for the second 100, and sprinting the last 100.
- *3 sets of 100 meters stroke of your choice* going at a moderate pace for the first 100, faster for the second 100, and sprinting the last 100.

Warm-down

- *100 meters stroke of your choice* at a very slow pace.
- *50 meters elementary backstroke or floating on your back*

Dryland Training Schedule and Voice-Over

The following document was created for the exercising/dryland portion of the SwimSmart application. The exercises were gathered from various books and online resources, and additional research was done to determine the best exercises for swimmers specifically.

I wrote the attached document so that I would know exactly how each exercise was supposed to look, as well as be able to keep track of the video shooting, voice overs, editing, etc. While recording the voice-overs in the audio booth, Jessica Dinaburg, my fitness model, read from the sheet so that her voice would accompany her exercises on video. Recording the audio separately from the video allowed me to be a little more creative when combining the two in the final edited video, and I was also able to stretch out the amount of time Jessica appeared on screen, something I wouldn't have been able to do had she been speaking while working out.

SWIM SMART

Dryland Completion & Voice Overs

Intros

"Welcome to the dryland portion of our workout."

"Welcome to the dryland portion of our workout. The stretches we will go over in this section are guidelines and suggestions to help keep you in shape and fit both in and out of the water.

Some of the stretches shown can also be used to target problem areas in your strokes, starts, turns, and even breathing. Doing cardio workouts like running, cycling, water aerobics, and other sports can help a swimmer become faster and stronger by working specific muscles in the same way they are used in swimming."

"Yoga and pilates are great practices to improve balance, flexibility, and connectiveness between the upper and lower portions of your body."

"Weight training is also effective in improving your strength and increasing your speed in the water. You can do traditional bicep and tricep curls, and other traditional weight training exercises, and you can also add weights to both your pilates workouts, as well as some of the arm exercises shown in this program. If adding weights to a stretch or exercise is encouraged, it will be explained to you."

Here we will cover some traditional warm-up, warm-down, and general stretches."

"For dryland routines that target specific problems, see the "common problems" section, or take a look at a particular stroke."

"The following dryland exercises should be performed regularly in addition to swimming drills to improve upon a weak area of your stroke."

"Here we focus on your kick in any of the four strokes. The areas of the body most associated with the freestyle and backstroke's flutter kick, breaststroke's whip kick, and butterfly's dolphin kick are addressed in this section and workouts are dryland stretches are demonstrated to help you strengthen those problem areas."

"Here we focus on your arm movements in all of the strokes. All arm movements involve some coordination with your back, shoulders, arms, and hands. The following exercises and stretches will help strengthen and tone those muscles you use most during your arm pulls."

"Here we focus on stretches and workouts that will help increase the power behind your push-offs, starts, and turns."

"Here we focus on a back or body roll which is used in the freestyle and backstroke."

"Here we focus on your chest and shoulders which are important in maintaining a streamline, balanced core in the water."

"These may be two of the most important parts of the body on which your stroke relies."

"Here we focus on body position in the water. These clips will show you the streamline position your body should be in at all times."
"Here we focus on a back or body roll which is used in the freestyle and backstroke."

"Perform this stretch everyday to maximize your performance."

"Perform this exercise everyday to increase your strength and flexibility."

"The following exercise will help improve upon your breaststroke kick, also known as the whip kick."
  REPEAT ABOVE WITH PLURAL (exercises)

"The following exercise will help improve upon your backstroke kick."
  REPEAT ABOVE WITH PLURAL (exercises)

"The following exercise will help improve upon your flutter kick, the kick you use with freestyle and backstroke."
  REPEAT ABOVE WITH PLURAL (exercises)

"The following exercise will help improve upon butterfly's dolphin kick."
  REPEAT ABOVE WITH PLURAL (exercises)

Rebecca Berent

"The following exercise will help improve upon your breaststroke arms."

*   ***REPEAT ABOVE WITH PLURAL (exercises)***

"The following exercise will help improve upon your backstroke arms."

*   ***REPEAT ABOVE WITH PLURAL (exercises)***

"The following exercise will help improve upon your crawl stroke, or the arm movement you use with your freestyle stroke."

"The following exercises will help improve upon your freestyle arm crawl."

"The following exercises will help improve upon your butterfly arms.

Ankle Circles

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Begin by sitting on the floor with your legs straight out infront of you. Raise one leg about six inches off the floor and rotate your ankle first clockwise, then counterclockwise for 10 full rotations. Repeat with your opposite ankle."

"For a weak kick, strengthening your ankles is especially important. Ankle circles help strengthen your ankle for all strokes, but is especially good at encouraging the whipping action used in the breaststroke kick."

"Ankle circles are a good addition to your normal workout routine because they strengthen your ankles in ways other exercises do not. Performing ankle circles everytime you swim is not necessary. You can occasionally throw it in to your general workout."

Ankle Rocking

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Kneel on the floor with your legs together and with

the tops of your feet against the floor with more weight on your heels. Place your hands on your knees and rock back and forth gently, stretching your toes and ankles."

"For a weak kick, strengthening your ankles is especially important. Ankle rocking helps to increase flexibility in your ankles and feet, and is beneficial to all strokes. It is especially important to perform ankle rocking at every workout if you are having problems with any of your kicks."

Shoulder Strangle

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Begin this stretch by crossing one arm horizontally over your chest and grasping it with your other hand. just above the elbow. Pull your upper arm towards your chest and aim to keep your hips and shoulders forward and inline with the rest of your body. This stretch works your shoulder and the back of your upper arm and helps with all strokes, especially butterfly"

Arm Over Shoulder

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"This stretch is great for working the tops of your shoulders and your triceps, as well as your waist. Stand with your arms overhead and hold your elbow with the hand of your opposite arm. Pull your elbow behind your head for a deep stretch.

Bridge

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Lie on your back, bend your knees, and place your feet on the floor under your bottom. Push your hips off the floor and roll up and back through your pelvis

<div align="right">Rebecca Berent</div>

and lower back, placing your hands palms down under your shoulders and into a full arch. If you are unable to perform this stretch, you may do a modified version which is to lie on your back, bend your knees and place your feet on the floor under your bottom to rest your weight on your shoulders."

"Performing the bridge stretch stretches and strengthens many of the muscles you use in swimming, especially the butterfly and the backstroke. The bridge stretch works your back, shoulders, chest, and front thighs."

"This stretch should be held as long as you comfortably can do it for, and this stretch should not be repeated more than one more time tops. It is an intense back stretch and you risk pulling a muscle or being sore if you overdo it."

7. Butterfly Stretch

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Sit on the floor with both knees bent, bringing your feet together so your knees point to the sides. Pull your heels as close to your body as possible. Keeping your back straight, take hold of your feet and lean forward towards your toes while pressing your knees down to the ground as well. Hold this stretch for 10 seconds or longer and repeat if you wish."

Crunches

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Begin by lying on your back with your knees bent and your arms resting lightly on the back of your head or neck, or across your chest. Curl your shoulders forward and towards your pelvis, keeping your neck straight and being careful not to let your hands press against your neck and alter the stretch. Return to your starting position on your back and repeat 20 times. Alternatives to this stretch isolate different parts of your abdominal muscles, as well as your obliques (your sides). These stretches are important for maintaining streamline position, as well as for

your body roll in the freestyle. Alternatives inclue lifting your body towards your left and right sides, as well as lifting your legs and performing crunches that way. Another way to stretch your abs is the leg lift crunch shown here. Tighten your buttucks and your abdominals as you lift your legs as high as you can. You may not get your legs very far off the ground at first, but you will surely feel a stretch when doing it."

"Here we focus on leg lifts that work the abdominals and buttocks to target your improve your center of balance for your streamline position. Lie on your back with your legs stretched out straight. Squeezing your buttocks and your abs, lift your legs as high as you can, and hold it for as long as your can. Repeat 5 times and increase the repetitions each week. Traditional crunches and sit-ups are also helpful exercises for your core, body roll, and streamline positioning.

Desert Lizard

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Begin this stretch on your hands and knees. Raise one leg out straight while simultaneously lifting the opposite arm. Point your toe and reach your arm out straight in front of you. Hold this stretch for 20 seconds. Switch arms and legs and repeat. This stretch is very important for developing a strong connection between the upper and lower halves of your body, which is an integral part of swimming better. This is a great way to train your body into maintaining a streamline position while swimming."

"Problems with keeping your body aligned are very common as a swimmer. We must remember to keep our bodies aligned, and our upper and lower halves working together to maintain good form and posture. Practice this stretch daily to force your body's upper and lower halves to align."

Rebecca Berent

Hamstring Stretch Sitting

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Begin by sitting on the floor with one leg extended straight out, and the other leg bent with your foot towards your body. Reach out with your hands, lean your upper body forward, and bring your chest towards your thigh. Make sure you don't round your upper back. Hold for 20 seconds and switch legs. This stretch can help develop strong hamstring muscles used in breaststroke's whip kick."

Forward Lunge

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

"Lunge forward with one foot well in front of the other. Facing in the direction of the forward foot, press your hips forward and down to the floor. Switch legs and repeat."

"Perform the forward lunge during your general workout at least once a week to strengthen your leg muscles and increase flexibility. If your whip kick needs improvement, feel free to perform this stretch daily or multiple times a day."

"The breaststroke's whip kick should propell your body surging through the water. A weak kick results in poor times, even if your arm movements are excellent. The best thing about the forward lunge is that it stretches and strengthens your legs for all kicks, especially breaststroke's whip kick. Do this stretch everyday in order to increase flexibility in your thighs and legs and greatly improve the power of your whip kick."

Handbridge

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete

Start on your hands and knees. Lift one leg and push it out from that side of the body as far as you can go. Make sure you point your toe and hold the stretch for a few seconds. Repeat 10 times for one leg, before switching and completing 10 more repetitions for the other leg."

"This stretch will help improve upon your streamline position in the water as well as your whip kick,. Perform this exercise everyday to strengthen your kick as well as improving connectivity between your upper and lower halves of your body, thus improving your body's streamline positioning.

"Both of these exercises are extremely helpful in improving upon your streamline position in the water. Both force you to be aware of your upper and lower halves, as well as your right and left. By performing these stretches regularly, you will greatly improve your connectivity and streamline, thus increasing your speed and making your swim better.

Jump Squats

- ❏ Film Exercise
- ❏ Record audio
- ❏ Edit video
- ❏ Complete
  - a.
  - b.
  - c

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Lower Back Arch

- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete

"Begin this stretch by lying face down. Bend your elbows and place your hands beneath your shoulders. Push yourself up, arching your back and looking up, keeping your pelvis down. Hold for 10 seconds and gently roll down."

"This stretch works your lower back and is especially improtant to improving upon your dolphin kick."

"If you have a weak dolphin kick, you will want to perform the lower back arch at least once a day to improve flexibility in your back. This stretch can greatly improve upon your success at the butterfly you are encouraged to add this stretch to your everday workouts."

Neck Rolls

- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete

Begin standing up facing forward with your arms relaxed or resting on your hips. Gently roll your head around from one shoulder, down, and to the other. Stop at the opposite shoulder and roll back down and back to the original shoulder. Do this 10-20 times.

"Don't roll your neck backwards because you risk hurting yourself or pinching a nerve."

"This stretch is a good warm up and can help you with your head turn while breathing during the freestyle."

"If you have trouble with getting your head out of the water while breathing during freestyle, perform neck rolls regularly and ideally at every warm-up and workout."

Pushups

- ❑ Film Exercise

- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Shoulder Rolls

- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Shoulder Shrugs
- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Shoulder Stretches
- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Spread Leg Stretch
- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Streamlines
- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video
- ❑ Complete
  - a.
  - b.
  - c

Toe touch standing
- ❑ Film Exercise
- ❑ Record audio
- ❑ Edit video

❑ Complete
   a.
   b.
   c

Toe touch sitting
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete
   a.
   b.
   c

Trunk Twists
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete

"Begin standing with your hands on your hips. Twist your right elbow and trunk to the left, return to center, and then twist to the right. Continue this pattern for a full 20 counts. This is extremely helpful in strengthening and improving your body roll."

"If you are having problems with your body roll in either backstroke or freestyle, perform trunk twists at every workout to help increase flexibilty and increase your range of motion."

Pilates Ball Workouts
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete
   a.
   b.
   c

Tug of War
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete

"Start with one arm bent up behind your head and the other arm down behind your waist. Slide your hands down your spine until your fingers touch. Grasp one hand with the other and pull gently like you are playing tug-of-war with yourself. If you can't reach your hands together, use a scarf or handkerchief. Hold the stretch for 10-20 seconds and repeat on the other side.

"This exercise beneifts all strokes and stretches the forearms, chest, and latissimus dorsi, or the lats. Do this exercise everytime you warm up or down to increase overall arm and shoulder strength and flexibility.

Kneeling Arch
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete

"Start this stretch kneeling with your legs and feet hip width apart. Lean back

Knee Bends
❑ Film Exercise
❑ Record audio
❑ Edit video
❑ Complete

"Begin this exercise standing with your hands on your waist. Bend your knees and go down as far as possible, while keeping your heels planted on the floor. You can either hold this stretch for 20 seconds, or do 10-20 repetitions holding for about a second each time."

"This exercise stretches the legs for push-offs during dives, starts, and turns and is extremely important when considering how powerful your push-offs should be, and how much they can benefitt your overall time. Having a strong push-off is almost as important as having perfect stroke form and should be addressed continuously. Try to integrates squats or jumping squats into your regular routine at least twice a week."

Rebecca Berent

ActionScript Code

Code for the video player

This code creates a dynamic video player that plays videos based on XML files that are passed through the player. Depending on the XML file, the video player will play a particular video, and generate thumbnail buttons that the user can click to switch to a different video.

```
import fl.video.FLVPlayback;
btn_close_vids.buttonMode = true;
btn_close_vids.index = numChildren -1;
btn_close_vids.addEventListener(MouseEvent.MOUSE_DOWN, onBtnPress);

function onBtnPress(e:MouseEvent):void {
     gotoAndPlay(21);
     }

var thumb_width:Number;
var thumb_height:Number;
var thumbs_x:Number;
var thumbs_y:Number;
var video_x:Number;
var video_y:Number;
var my_videos:XMLList;
var my_total:Number;

var main_container:MovieClip;
var thumbs:MovieClip;
var titles:Sprite;
var my_player:FLVPlayback;

var myXMLLoader:URLLoader = new URLLoader();
myXMLLoader.load(new URLRequest("playlist_free_basics.xml"));
myXMLLoader.addEventListener(Event.COMPLETE, processXML);
```

```
function processXML (e:Event):void
{
     var myXML:XML = new XML(e.target.data);
     thumb_width = myXML.@THUMB_WIDTH;
     thumb_height = myXML.@THUMB_HEIGHT;
     thumbs_x = myXML.@THUMBS_X;
     thumbs_y = myXML.@THUMBS_Y;
     video_x = myXML.@VIDEO_X;
     video_y = myXML.@VIDEO_Y;
     my_videos = myXML.VIDEO;
     my_total = my_videos.length();
     makeContainers();
     makePlayer();
}


function makeContainers():void{
     main_container = new MovieClip();
     addChild(main_container);
     thumbs = new MovieClip();
     thumbs.addEventListener(MouseEvent.CLICK, playVideo);
     thumbs.addEventListener(MouseEvent.MOUSE_OVER, onOver);
     thumbs.addEventListener(MouseEvent.MOUSE_OUT, onOut);
     thumbs.x = thumbs_x;
     thumbs.y = thumbs_y;
     thumbs.buttonMode = true;
     main_container.addChild(thumbs);
}


function callThumbs():void
{
     for (var i:Number = 0; i < my_total; i++)
     {
          var thumb_url = my_videos[i].@THUMB;
          var thumb_loader = new Loader();
          thumb_loader.name = i;
          thumb_loader.load(new URLRequest(thumb_url));
          thumb_loader.contentLoaderInfo.addEventListener(Event.COMPLETE,
thumbLoaded);
```

SWIM SMART

```
               thumb_loader.y = (thumb_height + 10) * i;
               var thumb_title = my_videos[i].@TITLE;
          }
    }


    function thumbLoaded(e:Event):void
    {
          var my_thumb:Loader = Loader(e.target.loader);
          thumbs.addChild(my_thumb);
    }


    function makePlayer():void
    {
          my_player = new FLVPlayback();
          my_player.skin = "SkinUnderPlaySeekMute.swf";
          my_player.fullScreenTakeOver = false;
          my_player.x = video_x;
          my_player.y = video_y;
          my_player.width = 460;
          my_player.height = 300;
          my_player.skinAutoHide = false;
          callThumbs();
          main_container.addChildAt(my_player, 0);
          my_player.source = my_videos[0].@URL;
          my_player.addEventListener(Event.ENTER_FRAME, checkVideoPlay);
          my_player.addEventListener(Event.ENTER_FRAME, checkVideoStop);
    }


    function playVideo(e:MouseEvent):void{
          var video_url = my_videos[e.target.name].@URL;
          my_player.source = video_url;
    }


    function onOver (e:MouseEvent):void
    {
          var my_thumb:Loader = Loader(e.target);
          my_thumb.alpha = 0.5;
    }
```

```
function onOut (e:MouseEvent):void
{
      var my_thumb:Loader = Loader (e.target);
      my_thumb.alpha = 1;
}


//events and functions for navigating through videos
function checkVideoPlay(e:Event)
{
      if(my_player.playing == true)
      {
            my_player.removeEventListener(Event.ENTER_FRAME, checkVideoPlay);
            my_player.addEventListener(Event.ENTER_FRAME, checkVideoStop);
      }
}


function checkVideoStop(e:Event)
{
      if(my_player.stopped == true || my_player.paused == true)
      {
            my_player.removeEventListener(Event.ENTER_FRAME, checkVideoStop);
            my_player.addEventListener(Event.ENTER_FRAME, checkVideoPlay);
      }
}
```

Code for the the main shell that loads the SwimSmart application:

This code is used on the main screen to launch the program in fullscreen mode, create a loader that will hold all subpages of the application, and calls a function that launches the menu section when a button is clicked.

```
import fl.video.FLVPlayback;
stop();
fscommand("fullscreen", "true");
fscommand("allowscale", "false");
stage.showDefaultContextMenu = false;
btn_enter.addEventListener(MouseEvent.CLICK, useProgram);
function useProgram(e:MouseEvent):void {
gotoAndPlay(2);
}

//Loader for loading pages
var myLoader:Loader = new Loader();
// add it to the stage
addChild(myLoader);
// position it
myLoader.x = 110;
myLoader.y = 76;
var url:URLRequest = new URLRequest("main.swf");
myLoader.load(url);

top_nav_coachadvice.btn_stroke3.addEventListener(MouseEvent.CLICK, goStroke3);
top_nav_coachadvice.btn_coach3.addEventListener(MouseEvent.CLICK, goCoach3);
top_nav_coachadvice.btn_exercises3.addEventListener(MouseEvent.CLICK, goExer-
cise3);
top_nav_coachadvice.btn_vidlib3.addEventListener(MouseEvent.CLICK, goVidLib3);
top_nav_coachadvice.btn_credits3.addEventListener(MouseEvent.CLICK, goCred-
its3);
```

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```
function goStroke3(e:MouseEvent):void {
var url_stroke:URLRequest = new URLRequest("page_stroketech.swf");
      myLoader.load(url_stroke);
}


function goCoach3(e:MouseEvent):void {
var url_coach:URLRequest = new URLRequest("page_coachadvice.swf");
      myLoader.load(url_coach);
}


function goExercise3(e:MouseEvent):void {
var url_coach:URLRequest = new URLRequest("page_practices.swf");
      myLoader.load(url_coach);
}


function goVidLib3(e:MouseEvent):void {
var url_coach:URLRequest = new URLRequest("page_vidlib.swf");
      myLoader.load(url_coach);
}


function goCredits3(e:MouseEvent):void {
var url_credits:URLRequest = new URLRequest("page_credits.swf");
      myLoader.load(url_credits);
}
```

Code for main SWF

This ActionScript code allows the user to load one of the five section by clicking the coore-sponding button. It also includes a video with user controls that is embedded within the Flash application. ActionScript was written for the video controls.

```
//Loader for loading pages
var myLoader:Loader = new Loader();
addChild(myLoader);
myLoader.x = 0;
myLoader.y = 0;

btn_1_stroke.addEventListener(MouseEvent.CLICK, goStroke);
btn_1_coach.addEventListener(MouseEvent.CLICK, goCoach);
btn_1_exercises.addEventListener(MouseEvent.CLICK, goExercises);
btn_1_video.addEventListener(MouseEvent.CLICK, goVidLib);
btn_1_credits.addEventListener(MouseEvent.CLICK, goCredits);

function goStroke(e:MouseEvent):void {
      var url:URLRequest = new URLRequest("page_stroketech.swf");
      myLoader.load(url);
      SoundMixer.stopAll();
      ns.pause();
      ns.seek(0);
      video_object.clear();
}

function goCoach(e:MouseEvent):void {
      var url2:URLRequest = new URLRequest("page_coachadvice.swf");
      myLoader.load(url2);
      SoundMixer.stopAll();
      ns.pause();
      ns.seek(0);
      video_object.clear();
}
```

SWIM SMART

```
function goVidLib(e:MouseEvent):void {
      var url5:URLRequest = new URLRequest("page_vidlib.swf");
      myLoader.load(url5);
      SoundMixer.stopAll();
      ns.pause();
      ns.seek(0);
      video_object.clear();
}


function goCredits(e:MouseEvent):void {
      var url3:URLRequest = new URLRequest("page_credits.swf");
      myLoader.load(url3);
      SoundMixer.stopAll();
      ns.pause();
      ns.seek(0);
      video_object.clear();
}


function goExercises(e:MouseEvent):void {
      var url4:URLRequest = new URLRequest("page_practices.swf");
      myLoader.load(url4);
      SoundMixer.stopAll();
      ns.pause();
      ns.seek(0);
      video_object.clear();
}


var nc:NetConnection = new NetConnection();
nc.connect(null);
var ns:NetStream = new NetStream(nc);
var nsDuration:Number
var metaDataListener:Object = new Object();


metaDataListener.onMetaData = function(meta:Object){
      nsDuration = Math.floor(meta.duration);
}
```

```
ns.client = metaDataListener
video_object.attachNetStream(ns);
ns.play("INTRO_SWIMSMART.flv");
pause_btn.addEventListener(MouseEvent.CLICK, videoControl);
play_btn.addEventListener(MouseEvent.CLICK, videoControl);
stop_btn.addEventListener(MouseEvent.CLICK, videoControl);
rewind_btn.addEventListener(MouseEvent.CLICK, videoControl);
BG_VID.addEventListener(MouseEvent.CLICK, playVideoIntro);

function videoControl(e:MouseEvent):void {
      if (e.target.name == "pause_btn"){
            ns.pause();
      } else if (e.target.name == "play_btn"){
            ns.resume();
      } else if (e.target.name == "stop_btn"){
            ns.pause();
            ns.seek(0);
      } else if (e.target.name == "rewind_btn"){
            ns.seek(0);
      }
}

function playVideoIntro(e:MouseEvent):void {
      ns.resume();
}

ns.pause();
var videoPlaying:Boolean = true;
```

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Code used for each section (page) within SwimSmart

This ActionScript controls each of the five sections within SwimSmart. The code is the same, but instance names are changed in order for each section to work and load properly. The code is split up based on it's location in the timeline.

```
import com.greensock.TweenLite;
import com.greensock.easing.*;
import com.greensock.*;
import fl.video.FLVPlayback;
import fl.video.VideoEvent;


main_hotspot_vid1.visible = true;
main_hotspot_vid1a.visible = true;
main_hotspot_vid2.visible = true;
main_hotspot_vid2a.visible = true;


VIDEO1_free.visible = false;
VIDEO2_free.visible = false;
VIDEO1_back.visible = false;
VIDEO2_back.visible = false;
VIDEO1_breast.visible = false;
VIDEO2_breast.visible = false;
VIDEO1_fly.visible = false;
VIDEO2_fly.visible = false;
Vid_main_1.visible = false;
Vid_main_2.visible = false;


var holder = toptip_stroke.width;
var movieClipWidth = (holder/5);
var movieClipMove = -1*movieClipWidth;


btn_free_stroketech.addEventListener(MouseEvent.CLICK, goSubFree);
btn_back_stroketech.addEventListener(MouseEvent.CLICK, goSubBack);
btn_breast_stroketech.addEventListener(MouseEvent.CLICK, goSubBreast);
btn_fly_stroketech.addEventListener(MouseEvent.CLICK, goSubFly);
btn_moretips.addEventListener(MouseEvent.CLICK, goNextTip);
```

```
main_hotspot_vid1.addEventListener(MouseEvent.CLICK, goVid1main);
main_hotspot_vid1a.addEventListener(MouseEvent.CLICK, goVid1main);
main_hotspot_vid2.addEventListener(MouseEvent.CLICK, goVid2main);
main_hotspot_vid2a.addEventListener(MouseEvent.CLICK, goVid2main);

function goSubFree(e:MouseEvent):void{
      gotoAndPlay("freestyle");
}

function goSubBack(e:MouseEvent):void{
      gotoAndPlay("backstroke");
}

function goSubBreast(e:MouseEvent):void{
      gotoAndPlay("breaststroke");
}

function goSubFly(e:MouseEvent):void{
      gotoAndPlay("butterfly");
}

function goNextTip(e:MouseEvent):void{
      var movieClipCurrent = toptip_stroke.x;
      if (toptip_stroke.x > -950){
            TweenLite.to(toptip_stroke, 1, {x:movieClipCurrent + movieClip-
Move, ease:Quad.easeInOut, delay:0});
      } else {
            toptip_stroke.x = 579;
      }
}

function goVid1main(e:MouseEvent):void{
      Vid_main_2.visible = true;
      Vid_main_2.gotoAndPlay(2);
}
```

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```
function goVid2main(e:MouseEvent):void{
      Vid_main_1.visible = true;
      Vid_main_1.gotoAndPlay(2);
}


main_hotspot_vid1.visible = true;
main_hotspot_vid1a.visible = true;
main_hotspot_vid2.visible = true;
main_hotspot_vid2a.visible = true;
VIDEO_intro_tip.visible = false;
VIDEO_intro_tip_back.visible = false;
VIDEO_intro_tip_breast.visible = false;
VIDEO_intro_tip_fly.visible = false;


VIDEO1_free.visible = false;
VIDEO2_free.visible = false;
VIDEO1_back.visible = false;
VIDEO2_back.visible = false;
VIDEO1_breast.visible = false;
VIDEO2_breast.visible = false;
VIDEO1_fly.visible = false;
vid2_fly2.visible = false;
Vid_main_1.visible = false;
Vid_main_2.visible = false;


btn_close_stroke.addEventListener(MouseEvent.CLICK, closeSubStrokes);
function closeSubStrokes(e:MouseEvent):void{
      nextFrame();
}
```

Code used for each Stroke in the "Stroke Technique" section

This ActionScript controls each of the strokes (Freestyle, Backstroke, Breaststroke, Butterfly) within the "Stroke Technique" section of SwimSmart. The code is the same, but instance names are changed in order for each section to work and load properly. The code is split up based on it's location in the timeline.

```
stop();

VIDEO_intro_tip.visible = true;
VIDEO_intro_tip.gotoAndStop(1);

VIDEO_intro_tip.buttonMode = true;

main_hotspot_vid1.visible = false;
main_hotspot_vid1a.visible = false;
main_hotspot_vid2.visible = false;
main_hotspot_vid2a.visible = false;
btn_video_breast_basics.visible = false;
btn_video_breast_vids.visible = false;
btn_video_fly_basics.visible = false;
btn_video_fly_vids.visible = false;
btn_video_back_basics.visible = false;
btn_video_back_vids.visible = false;

btn_video_freestyle.addEventListener(MouseEvent.CLICK, goVidFree);
btn_video_freestyle2.addEventListener(MouseEvent.CLICK, goVidFree2);
VIDEO_intro_tip.addEventListener(MouseEvent.CLICK, goTipFree1);

function goVidFree(e:MouseEvent):void{
     VIDEO1_free.visible = true;
     VIDEO1_free.gotoAndPlay(2);
     SoundMixer.stopAll();
}
```

SWIM SMART

```
function goVidFree2(e:MouseEvent):void{
      VIDEO2_free.visible = true;
      VIDEO2_free.gotoAndPlay(2);
      SoundMixer.stopAll();
}


function goTipFree1(e:MouseEvent):void{
      TIP1_free.visible = true;
      TIP1_free.gotoAndPlay(2);
      VIDEO_intro_tip.visible = false;
}


import fl.video.FLVPlayback;
btn_close_vids.buttonMode = true;
btn_close_vids.index = numChildren -1;
btn_close_vids.addEventListener(MouseEvent.MOUSE_DOWN, onBtnPress);


function onBtnPress(e:MouseEvent):void {
      gotoAndPlay(21);
      }


var thumb_width:Number;
var thumb_height:Number;
var thumbs_x:Number;
var thumbs_y:Number;
var video_x:Number;
var video_y:Number;
var my_videos:XMLList;
var my_total:Number;
var main_container:MovieClip;
var thumbs:MovieClip;
var titles:Sprite;
var my_player:FLVPlayback;


var myXMLLoader:URLLoader = new URLLoader();
myXMLLoader.load(new URLRequest("playlist_free_basics.xml"));
myXMLLoader.addEventListener(Event.COMPLETE, processXML);
```

S W I M   S M A R T

```
function processXML (e:Event):void
{
     var myXML:XML = new XML(e.target.data);

     thumb_width = myXML.@THUMB_WIDTH;
     thumb_height = myXML.@THUMB_HEIGHT;
     thumbs_x = myXML.@THUMBS_X;
     thumbs_y = myXML.@THUMBS_Y;
     video_x = myXML.@VIDEO_X;
     video_y = myXML.@VIDEO_Y;
     my_videos = myXML.VIDEO;
     my_total = my_videos.length();
     makeContainers();
     makePlayer();
}


function makeContainers():void{
     main_container = new MovieClip();
     addChild(main_container);
     thumbs = new MovieClip();
     thumbs.addEventListener(MouseEvent.CLICK, playVideo);
     thumbs.addEventListener(MouseEvent.MOUSE_OVER, onOver);
     thumbs.addEventListener(MouseEvent.MOUSE_OUT, onOut);
     thumbs.x = thumbs_x;
     thumbs.y = thumbs_y;
     thumbs.buttonMode = true;
     main_container.addChild(thumbs);
}


function callThumbs():void
{
     for (var i:Number = 0; i < my_total; i++)
     {
          var thumb_url = my_videos[i].@THUMB;
          var thumb_loader = new Loader();
          thumb_loader.name = i;
          thumb_loader.load(new URLRequest(thumb_url));
```

SWIM SMART

```actionscript
            thumb_loader.contentLoaderInfo.addEventListener(Event.COMPLETE,
thumbLoaded);
            thumb_loader.y = (thumb_height + 10) * i;
            var thumb_title = my_videos[i].@TITLE;
      }
}


function thumbLoaded(e:Event):void
{
      var my_thumb:Loader = Loader(e.target.loader);
      thumbs.addChild(my_thumb);
}


function makePlayer():void
{

      my_player = new FLVPlayback();
      my_player.skin = "SkinUnderPlaySeekMute.swf";
      my_player.fullScreenTakeOver = false;
      my_player.x = video_x;
      my_player.y = video_y;
      my_player.width = 460;
      my_player.height = 300;
      my_player.skinAutoHide = false;
      callThumbs();
      main_container.addChildAt(my_player, 0);
      my_player.source = my_videos[0].@URL;
      my_player.addEventListener(Event.ENTER_FRAME, checkVideoPlay);
      my_player.addEventListener(Event.ENTER_FRAME, checkVideoStop);
}

function playVideo(e:MouseEvent):void{
      var video_url = my_videos[e.target.name].@URL;
      my_player.source = video_url;
}
```

```
function onOver (e:MouseEvent):void
{
      var my_thumb:Loader = Loader(e.target);
      my_thumb.alpha = 0.5;
}


function onOut (e:MouseEvent):void
{
      var my_thumb:Loader = Loader (e.target);
      my_thumb.alpha = 1;
}


function checkVideoPlay(e:Event)
{
      if(my_player.playing == true)
      {
            my_player.removeEventListener(Event.ENTER_FRAME, checkVideoPlay);
            my_player.addEventListener(Event.ENTER_FRAME, checkVideoStop);
      }
}


function checkVideoStop(e:Event)
{
      if(my_player.stopped == true || my_player.paused == true)
      {
            my_player.removeEventListener(Event.ENTER_FRAME, checkVideoStop);
            my_player.addEventListener(Event.ENTER_FRAME, checkVideoPlay);

      }
}
```

Coach Interview Questions

• General Questions

   • In your opinion, what is the best workout schedule or routine a competitive

   swimmer can adopt? (days/week, hrs/day, etc.)

   • What is the most important stroke/technique to focus on when working out?

   • What are the best drills for:

        • Freestyle kick

        • Freestyle arms

        • Butterfly kick

        • Butterfly arms

        • Breaststroke kick

        • Breaststroke arms

        • Backstroke kick

        • Backstroke arms

        • Body roll strengthening

        • Improving starts

        • Improving turns

        • Going faster

        • Improving breathing pattern

   • What are some helpful tricks or tips you would suggest to a competitive swimmer

   to swim faster at meets?

   • What is the best way for a swimmer to understand how the body should move

   in the water?

   • Do you think video is a good solution for assisting swimmers in the water?

   Why or why not? Do you believe it's better to learn from doing, watching,

   listening, reading, or some combination of the four?

- Problems
  - What would you have a swimmer do who has:
  - A weak kick?
  - Problems with body roll
  - Breathing difficulties
  - Difficulty with arm pull
  - Difficulty starting/turning
  - How do you instruct a swimmer to perform in practice vs. in a race? (What is generally different about swimming in the two situations)
  - What is a common problem you see a lot, and how do you instruct a swimmer to fix it?
  - What are the most common issues for competitive swimmers?
  - What is the most common mistake you see made in the pool?

Swimming Video and Content Plan

• All strokes down and back

> • Freestyle close-up
>
> • Freestyle wide shot
>
> • Freestyle medium shot
>
> • Backstroke close-up
>
> • Backstroke wide shot
>
> • Backstroke medium shot
>
> • Breaststroke close-up
>
> • Breaststroke wide shot
>
> • Breaststroke medium shot
>
> • Butterfly close-up
>
> • Butterfly wide shot
>
> • Butterfly medium shot
>
> • Close-up of turns
>
> • Medium of turns
>
> • Long of turns
>
> • Close-up of underwater pulls and streamlines
>
> • Medium of streamline
>
> • Long on streamline

• Treading water

• Treading water with a brick

• Skulling on your back, go all the way down the length of the pool

> • Wide shot
>
> • Medium
>
> • Close-up

S W I M   S M A R T

- Three backstroke pulls, switch to three freestyle pulls, etc.

    - Wide

    - Medium

    - Close-up

- IM (100)

    - Close-up of each stroke

    - Close-up of the changing of each stroke/turns

    - Wide of each stroke

    - Wide of turns

    - Med of each stroke

    - Med of turns

- Freestyle and Back Balance drill

    - Freestyle down: only pull on one side and breath on opposite.

      Switch halfway down the pool to the other side

    - Backstroke down: only pull on one side.

      Switch halfway down the pool to the other side

    - Close-up

    - Medium

    - Wide

- Catch-up Drill

    - Close-up

    - Medium

    - Wide

- Butterfly with your eyes closed

    - Close-up

- Butterfly: one pull to every three kicks

    - Close

    - Medium

    - Wide

- Backstroke: on your back with fins

- Push off and kick seven counts, then take one stroke with one arm and stop, kick for another seven counts and pull again with the other arm. Continue this pattern.

    - Close

    - Medium

    - Wide

- One-arm backstroke drill: start halfway down and swim to the end of the pool with one arm above your head with the other by your side, kicking. Switch arms when you get to the wall and swim halfway back down.

    - Close

    - Medium

    - Wide

- Flipper workouts

    - Flutter kick

        - Close

        - Medium

        - Wide

    - Dolphin kick

        - Close

        - Medium

        - Wide

- Backstroke kick

    - Close

    - Medium

    - Wide

- Kickboard drills (halfway down for each)

    - Freestyle

        - Close

        - Medium

        - Wide

- Breaststroke

    - Close

    - Medium

    - Wide

- Butterfly

    - Close

    - Medium

    - Wide

- Backstroke (no board, hands above head streamline position)

    - Close

    - Medium

    - Wide

- Breaststroke with your eyes closed (halfway down the pool)

    - Close-up

- Breaststroke: Jeanie position

    - Keep your arms folded in front of you while doing breaststroke kick

SWIM SMART

- Starts/Dives
  - Backstroke
  - Freestyle
  - Breaststroke
  - Butterfly

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