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THE USE OF AN INTERACTIVE ONLINE TUTORIAL FOR

CAMERA OPERATORS AT BYU BROADCASTING

by

Andrew D. Schmidt

A master's project submitted to the faculty of

Brigham Young University

in partial fulfillment of the requirements for the degree of

Master of Science

Department of Instructional Psychology and Technology

Brigham Young University

August 2006

BRIGHAM YOUNG UNIVERSITY

GRADUATE COMMITTEE APPROVAL

of a project submitted by

Andrew D. Schmidt

This project has been read by each member of the following graduate committee and by majority vote has been found to be satisfactory.

_____   _____
Date   J. Olin Campbell, Chair

_____   _____
Date   Paul F. Merrill

_____   _____
Date   Richard R. Sudweeks.

BRIGHAM YOUNG UNIVERSITY

As chair of the candidate's graduate committee, I have read the selected project of Andrew D. Schmidt in its final form and have found that (1) its format, citations, and bibliographical style are consistent and acceptable to fulfill university and department style requirements, (2) its illustrative materials including figures, tables, and charts are in place, and (3) the final manuscript is satisfactory to the graduate committee and is ready for submission to the university library.

_____   _____
Date   J. Olin Campbell
                                        Chair, Graduate Committee

Accepted for the Department   _____
                                        Andrew S. Gibbons
                                        Department Chair

Accepted for the College   _____
                                        K. Richard Young
                                        Dean, David O. McKay School of Education

ABSTRACT

THE USE OF AN INTERACTIVE ONLINE TUTORIAL FOR

CAMERA OPERATORS AT BYU BROADCASTING

Andrew D. Schmidt

Department of Instructional Psychology and Technology

Master of Science

This report describes the purpose, analysis, design, development, and evaluation of a web-based tutorial to train student television camera operators for BYU Broadcasting at Brigham Young University. The report includes the results from audience and needs analyses, the rationale for the instructional approach, reviews of existing instructional materials, and reviews of instructional theory and practice literature. It also describes multiple evaluation activities for the tutorial and a critique of the project. The audience and needs analyses found that an interactive, web-based tutorial would be an appropriate delivery method for the instruction. The instructional literature review supports the project's instructional and evaluation methodologies, especially its extensive use of rapid prototyping. The evaluation report describes multiple iterations with paper and electronic prototypes and a field test with 11 target audience members. This report describes how testing and revision iterations led to multiple improvements in the product, and a pre- and

posttest administered during the field test demonstrated a significant increase in the intended learning outcomes. The projects exemplified many strengths and pleased the stakeholders, although further improvements in the instruction, assessment, and evaluation could have been implemented with more time and resources.

ACKNOWLEDGEMENTS

Many people contributed to the design and development of this project and deserve recognition. My sincere appreciation to the BYU Broadcasting employees for their input in the design and evaluation, including Duane Roberts, Scott Hill, Don Rigby, Michael Hunter, Jason Parker, and many others. Many thanks to the IT department at BYU Broadcasting for providing me with a laptop and software that enabled me to finish the project. And a special thanks to the student volunteers who participated in the audience analysis and evaluation. I could not have done it without your help.

I would also like to thank the members of my committee, Dr. J. Olin Campbell, Dr. Paul Merrill, and Dr. Richard Sudweeks for their excellent input and assistance. Finally, I'd like to thank my wife Cindy and children Emma and Nathan for their endless emotional support.

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Introduction

The Instructional Problem

The production division of BYU Broadcasting at Brigham Young University regularly hires BYU students and recruits student volunteers to operate television cameras. Student operators have occasionally taken Theater and Media Arts (TMA) classes about television production, but many students have not taken courses, and university curriculum changes have limited the number of television courses available. Some students have prior work experience in television production; others, however, have little or no experience.   Students are therefore trained on the job or in workshops offered by BYU Broadcasting. However, training tends to be fragmented and rushed, and scheduling challenges prevent many students from attending workshops before their first day running a camera.

Students need consistent and thorough training with guaranteed availability before working at BYU Broadcasting. To answer this need, BYU Broadcasting requested a stand-alone, self-paced camera operating tutorial and test for new students to complete before their first day at work. The primary stakeholder who proposed this idea was Duane Roberts, TV general manager at BYU Broadcasting. Although Duane has left BYU since the inception of this project, other BYU Broadcasting producers, directors, and employees and the current and future student employees and future students are interested in and have supported this project.

The Purpose of the Project

This tutorial would need to cover topics most necessary for students to learn before their first day, including technical jargon, theoretical concepts, operating techniques, and basic crew etiquette and logistics. Technical jargon includes terms for

concepts, procedures, and camera parts. Theoretical concepts include theory behind certain procedures, such as framing up a shot according to the rule of thirds, or a rule that enhances the aesthetic appeal of a shot. Operating techniques include how to create appropriate and attractive shots. Basic crew etiquette and logistics include procedures, expectations, and responsibilities for setting up a camera, staying on the camera, and reporting problems. The test should certify that students have achieved a predetermined level of knowledge, understanding, and application of these items.

I consulted with and observed BYU Broadcasting producers, directors, and student employees, and I developed learning objectives (see Appendix A) based on the information that I gathered. In summary, the objectives state that after completing the tutorial, the learners will be able to do the following:

1. Apply principles of framing up camera shots. This objective includes demonstrating shot composition and the rule of thirds. It also includes understanding proper zooms and pans, and identifying categories of shots and shots that would be appropriate to frame up under certain circumstances.

2. Recognize different types of camera shots. This objective includes recognizing un-encountered examples of standard shots, such as a close-up or a wide shot. It also includes correcting un-encountered examples of standard shots.

3. Focus the camera lens appropriately. This includes demonstrating how to operate the focus controls for both the front and back of the lens.

4. Identify the location and function of relevant camera controls. This objective includes recognizing the location and function of the controls that are most important to know in order to properly operate a camera.

5. Understand specific procedures for setting up cameras. These procedures include avoiding hazards, running cables, balancing the camera, and the processes of white balance and FAX ("Full Auxiliary Check"). White balance involves adjusting the camera's light sensors to properly record colors, and FAX involves checking and troubleshooting cameras before each broadcast. Students should be able to recognize examples and non-examples of these procedures and correctly order individual steps into a complete procedure.

Target Audience

The primary audience for the training includes BYU Broadcasting student employees, who are mostly undergraduate BYU students with occasional graduate students. As mentioned above, some students have prior experience running cameras for television productions, while others have no experience and need comprehensive training. A secondary audience for this instruction includes current BYU Broadcasting employees—full or part-time—who want to improve and certify their camera skills. Most learners are motivated to learn the subject matter to obtain or retain employment, and many are motivated simply out of an interest in television and film. All learners have access to the Internet through computers from BYU office computers or computer labs.

The target audience as referenced in this report includes both current BYU students not employed at BYU Broadcasting and current BYU Broadcasting employees who wish to take the tutorial. During the evaluation, I focused on analyzing and serving the non-employee students, since they are the primary, majority audience. For rapid prototyping and field test participants, I sought out students with an interest in television and film, similar to many BYU Broadcasting employees. However, I allowed any students to participate regardless of their interests, since some students work at BYU

Broadcasting because they need a job and not because they are interested in film or television.

Audience and Needs Analyses

During the audience and needs analyses, I observed television productions and interviewed full-time and student employees at BYU Broadcasting. From these observations and interviews I learned the skills and knowledge that the tutorial should teach—a list that grew steadily throughout the analysis. I interviewed four full-time production employees who agreed that a tutorial would be helpful, and who suggested several topics for the list. I then interviewed and observed current part-time student employees, who actually provided more ideas than the full-time employees. For example, two students once strung the wrong end of a 500-foot cable to a camera before realizing their mistake. Other students shooting devotional addresses did not realize the need to shoot transition shots, or shots that showed speakers standing up or sitting down between speaking at the podium. Often students did not realize how to use the return button, which showed the on-air image in their viewfinders. Students realized their performance discrepancies, occasionally gathering with other students and asking how to coil cables, or what the viewfinder's safety zone means, or what it means to be "readied." The need for thorough and consistent training became very obvious.

During the audience and needs analyses I investigated several methods to deliver the training. I considered a printed job aid, but decided against it because of several reasons. First, concepts such as zooming and panning cannot be easily demonstrated by static images on a piece of paper. Printed pages also cannot provide feedback and interactivity as easily as electronic mediums. Job aids also do not typically emphasize permanent learning and assessment, but instead provide information for a particular point

in time, for choices or decisions, or to accomplish a temporary task (Keirns, 1998). My stakeholders wanted a more structured approach with formal assessment and permanent learning. The fast-paced, high-pressure task of operating live television cameras also offers little time to refer to a thick, detailed job aid as a primary source of learning.

Another delivery possibility was an interactive DVD. BYU Broadcasting has produced a DVD to train students how to shoot football games, which demonstrates typical shots and techniques. To deliver this training, the broadcast director plays the DVD on a laptop computer before the game, pausing the DVD to explain concepts where necessary. This training lasts about 10 minutes. The students liked the DVD, and it appeared to effectively teach the concepts. The sports broadcast producers also hope to produce similar DVDs for other sporting events. I considered creating a similar DVD to teach students basic camera skills that they would watch on a laptop before the broadcast.

I decided against using the DVD, however, after weighing several factors. First, the large number of objectives would require much more viewing time than the football DVD. Students may have 10 to 15 minutes to spare before a broadcast, and a basic camera skills DVD may take up to an hour to watch. Second, a traditional viewable DVD does not provide easy methods for assessment, tracking student progress or providing feedback. Third, a DVD may be forgotten, lost, scratched, or otherwise made unavailable before students can view it. My primary stakeholder wanted the training guaranteed to be available before students begin work, and if possible even before their job interview, so they have the option of the taking the training before being hired. The logistics of delivering a DVD to every student before their job interview proved too challenging.

The next option I considered was a web-based tutorial. I discussed this option during a focus group with four current BYU Broadcasting students on September 24, 2005. As expected, they indicated that the best delivery method would be face-to-face, hands-on training; however, they also agreed that a self-paced online tutorial could help. One student wished that he had such a tutorial weeks earlier while learning a new piece of equipment. Another student said he wanted to avoid an Internet experience that was annoying or a waste of time. They thought if the tutorial was engaging and interactive that it would be worth their time. After this discussion I brainstormed ideas for interactive exercises for the tutorial.

Rationale for Delivery Method

To summarize, the Internet appeared to be the best delivery option because of three basic reasons: (a) ease of distribution, (b) appropriateness for the learning objectives, and (c) ease of assessment. Each of these is explained below.

1. Ease of distribution. Since all of the students need to receive this training before their first day at work, the Internet provides a fast and reliable method to deliver the training. Unlike a DVD or paper-based tutorial, online instruction cannot be lost, forgotten, scratched, consumed by pets, etc. The largest distribution obstacles would be students losing or forgetting the URL, or the server becoming temporarily unavailable.

2. Appropriateness for the learning objectives. Many of the tutorial's concepts are best demonstrated as graphical illustrations, and some concepts such as zooms, pans, and movements work best as animations or video. Since students wanted interaction, the Internet provides many options for automated feedback, drill-and-practice, click-to-view activities, and other activities to

engage different learning styles. The Internet also provides flexibility for students to learn at their preferred pace and skip portions that they have already mastered. This flexibility allows the instruction to become more tailored to the abilities of the learners.

3. Ease of assessment. The assessment, like the instructional materials, should be automated to guarantee that students can complete it before coming to work. It should approximate real camera operation by asking the user to interact with images that resemble real cameras and viewfinder images. The test results must also be in a format that can be emailed to supervisors to track students' progress. All of these objectives may be accomplished by using the Internet.

<div align="center">Literature Review</div>

Review of Existing Instructional Materials

Instructional design projects typically review existing instructional materials to gather ideas and investigate whether similar solutions exist. I began reviewing literature believing that I would not find instructional materials that would be easily adaptable for my stakeholders' needs. Most external texts and instructional sources have different and insufficient content for the necessary learning objectives and typically lack assessment activities. Stakeholders wanted focused instructional content that was extremely relevant to particular needs at BYU Broadcasting, including the terminology, roles, and procedures used in BYU Broadcasting productions. I assumed this need would preclude using general, prefabricated television manuals and training materials.

A quick search of instructional websites about cinematography and television production confirmed my suspicion. For example, the website "Elements of Cinematography" (Kitagawa, 2003) contains several good explanations of types of shots,

but little information on other subjects. The following three websites have much more information about operating and setting up video cameras: (a) "Videography for Educators" (Apple Learning Interchange: Technology Showcases, 2003), (b) "Video 101" (Trinklein, 2005), and (c) "Media College.com" (Wavelength Media, 2006). However, these sites do not cover all of the learning objectives. It could be possible to use portions of these sites and create supplementary materials where needed. Students could visit the sites and supplementary and assessment materials in an activity similar to a WebQuest (Dodge, 2006). However, BYU Broadcasting could not guarantee the continued availability of these externals websites, and students may find it more convenient to visit a single standardized site without unnecessary web surfing. I therefore decided to create a new web-based tutorial customized for BYU Broadcasting. I still referred to these external resources during the design process, but only to check the accuracy and thoroughness of my own written tutorial.

Printed textbooks also provided references and clarifications that helped me write descriptions of certain concepts. For example, *Cinematography* (Malkiewicz & Mullen, 2005) helped clarify my understanding of focal length, back focus, and depth of field. *The Bare Bones Camera Course for Film and Video* (Schroeppel, 1980) reminded me to discuss concepts such as depth of field, focal length, balance, matching eyelines, and the purpose of zooming out. Zettl's *Television Production Handbook* (2000) and Housman and Palombo's *Modern Video Production* (1993) provided more comprehensive curriculum lists to check the thoroughness of my tutorial. After consulting these sources, I finished my review of instructional materials, and I turned to my own data from the rapid prototyping and needs analyses to shape my content.

Review of Instructional Theory and Practice Literature

Instructional design projects typically draw from similar foundational methodologies and theories. I employed many principles from these classic models, which typically include forms of analysis, design, development, implementing, and evaluating. One oft-cited model originates with Dick, Cary, and Carey (2004), who list nine components guiding the design and development of instruction. I put every component into practice, beginning with analyzing the needs, learners, and other contextual issues, and writing objectives before assessment instruments. After defining the needs, objectives, and assessments, I completed the instructional strategies, instructional materials, formative evaluation, and revisions. This sequence ensures that the instructional materials and assessment match the objectives and needs by defining the objectives and needs first. Another text that influenced my methodology was Cennamo and Kalk (2005), who similarly stress defining needs, outcomes, and assessments before instructional strategies.

I defined my intended learning outcomes based on Gronlund (2000), who classifies objectives into two categories: (a) general instructional objectives and (b) specific learning outcomes. My general instructional objectives include five items broadly describing what students should be able to do after completing the tutorial. Each general instructional objective has between two and seven specific learning outcomes providing detailed descriptions of what the learner should be able to do. Refer to Appendix A for a complete list of the instructional objectives.

Although the instructional practices and models above are very useful, some designers conclude that very broad and general instructional models lose their relationship to real situations, not allowing broad ranges of problem-solving activities or

differences in learning styles (Nixon & Lee, 2001). Such instructional models lose their effectiveness in complex and dynamic situations when they are linear instead of cyclical (Dorsey, Goodrum, & Schwen, 1997). Because of these concerns, I implemented rapid prototyping. Rapid prototyping is the "process of quickly building and evaluating a series of prototypes" (Jones, Li, & Merrill, 1992, p. 96). Prototypes are early and typically incomplete versions of the final product (Tessmer & Wedman, 1995). Rapid prototyping has been called a paradigm shift—where the designer is valued not only as designer, but as inquirer (Rathbun, 1997). It is particularly helpful when the designer is unfamiliar to the design situation (Tessmer, 1994), which describes my situation as a beginning designer.

Rapid prototyping may use at least two types of prototypes. Scope prototypes lack functionality but represent the look and feel of the final product. Executable prototypes are functional and evolve into the final product after revisions (Jones & Richey, 2000). I used both scope and executable prototypes. My paper scripts and simple illustrations were scope prototypes since they represented the partial look and feel of the final product without functionality. The early working versions of the tutorial were executable prototypes that evolved into the final project.

Although rapid prototyping has been shown to effectively deal with complexities of specific learning situations (Dorsey, et al., 1997), it has disadvantages. Its design is typically undisciplined, and its frequent tests often involve partial prototypes, requiring further testing (Tessmer, 1994). Because of this disadvantage I also conducted a more structured field test with the complete prototype, acknowledging that rapid prototyping is meant to enhance, not replace the classic formative evaluation approaches (Tessmer, 1994).

Another question that I researched is how to organize and present my information. Some of the techniques of presentation were obvious and generic. Norman (1973) reminds designers to explain generalities before specifics, giving priority to concepts closely related to existing knowledge. I implemented this concept whenever possible. For example, immediately after explaining the types of camera shots, I included a section about when each type of shot is appropriate. After explaining proper zooms, pans, and tilts, I applied these concepts to following moving objects.

An additional aspect of presenting information is the proper use of examples in teaching and assessing. Research has shown the learning improves with un-encountered examples in the assessment (Moore, 2006). While I wrote the review exercises and assessment items, I created all un-encountered examples; however, schedule constraints prevented me from finishing all the un-encountered items in the final tutorial. This represents a regrettable flaw in the tutorial's design.

One further issue related to presentation is the appropriate use of graphics and animations. Although animations can attract interest, they may distract. Animations are best when their attributes are congruent to the learning task (Rieber, 1990). I therefore limited animations to concepts that required motion to demonstrate, such as zooming, setting the focus, and adjusting the white balance.

Another issue that I researched was the order to present the modules. The modules ranged from theoretical principles, such as composition and the rule of thirds, to technical procedures such as how to set up the tripod. Halff (1988) recommends that automated instruction should have structural transparency, where the sequence of exercises and examples reflects the structure of the procedure being taught. The procedure of operating a camera would conceivably begin with setting up the camera,

running cables, troubleshooting, and then operating the camera by framing up attractive shots. To follow this structure, the tutorial would first teach camera setup and camera controls before teaching the theoretical aesthetic concepts of operating a camera. However, this is not the order that I used. I placed the conceptual shot framing and movement material first and the technical setup and controls information last. I did not want to intimidate users with technical information at the beginning of the tutorial, and my rapid prototyping participants preferred learning theoretical concepts before technical details. Interestingly, this order of modules also has structural transparency. For example, in real life situations, television directors and camera operators do not first think about how to set up the camera, but where to set up the camera to shoot good shots that enhance and support the goals of the television program. The technical aspects of setting up the camera and adjusting its controls are subservient to the aesthetic and communication objectives. Hence, the structure to teach the conceptual material before the technical material reflects the procedure in the real environment.

Another concept from Halff (1988) that guided this tutorial's organization is individualization, which suggests that exercises and examples should fit the current pattern of skills and weaknesses of the students. The goal to individualize learning for web-based instruction can be technically challenging, requiring innovative computer programming and database management. I realized that I may not be able to fully achieve individualization given the project's limited scope; however, I attempted to individualize as much as possible. For example, users may access or bypass any module at any time and in any order, skipping unfamiliar material. Feedback for the camera controls exercises gives some individualized feedback depending on where the user clicked. The controls review also allows users to repeat the exercises until they are ready

to move on. A more successful attempt at individualization involves the feedback after the test, which indicates which modules users should review based on their test performance. If users score less than perfect for the questions relating to a module, a circle appears over the module name indicating that they should review it.

<div align="center">Description of Instructional Materials</div>

The Instructional Modules

The tutorial is organized into five modules: (a) Framing up Shots, (b) Movement, (c) Focus, (d) Camera Controls, and (e) Camera Setup. As explained in the evaluation section below, the feedback from rapid prototyping helped me develop this organization and order of topics. An introduction page (see Figure 1) precedes the modules, and the test is placed after the last module.

Camera Operating Tutorial - BYU Broadcasting
Introduction

Welcome to the camera operating tutorial!

If you're new to television production, this tutorial will help you obtain the skills and understanding necessary to do your job. More importantly, this tutorial will help you avoid any verbal reproach, berating, bawling out, or dressing down on your first day of work.

This tutorial consists of 5 modules:

1) *Framing* - How to "frame up" a proper television shot.
2) *Movement* - How to perform moves such as zooms, pans, and tilts.
3) *Focus* - How to adjust your camera's focus and back focus.
4) *Controls* - Explanations of all important camera controls.
5) *Setup* - Some important tips about setting up the camera.

You may access any module at any time by using the menu bar below.

Yes, there will be a test. But don't panic! Spread throughout each module are review exercises. *If you complete the review exercises, you will be VERY well prepared for the test*. You may take the test as many times as you would like before submitting your score to your supervisor.

Let's begin. Click the button below for the first module: 1) Framing

Intro   1) Framing   2) Movement   3) Focus   4) Controls   5) Setup   Test

Figure 1. Screen shot of the introduction page of the tutorial.

Each module has between 7 and 25 pages. The modules have marked review exercises spread throughout. Although the modules and test are meant to be completed in their listed order, they may be accessed in any order using the menu bar at the bottom of the screen. Additional navigation appears on each page, allowing the user to navigate between the pages within the module (see Figure 2).
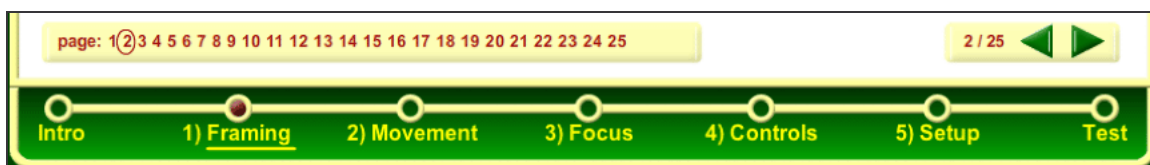

Figure 2. Screen shot of the tutorial's navigation.

The first page of every module introduces the module and lists vocabulary and sections in the module. The first module entitled Framing up Shots is divided into six lettered sections: (a) the rule of thirds; (b) head room; (c) nose room; (d) background and balance; (e) types of shots; and (f) selling shots (see Figure 3). Interactive review exercises ask users to click and drag images and arrange them within a frame to follow good composition principles (see Figure 4). Other review exercises ask users to identify types of shots and identify appropriate shots to frame up during specific circumstances (see Figure 5).

Figure 3. Screen shot of Introduction page for Module 1 – Framing Up Shots.
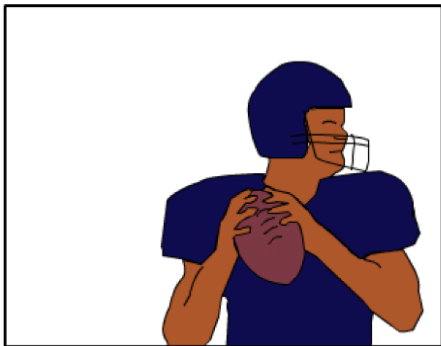

Figure 4. Screen shot of rule of thirds review exercise from Framing Up Shots module.
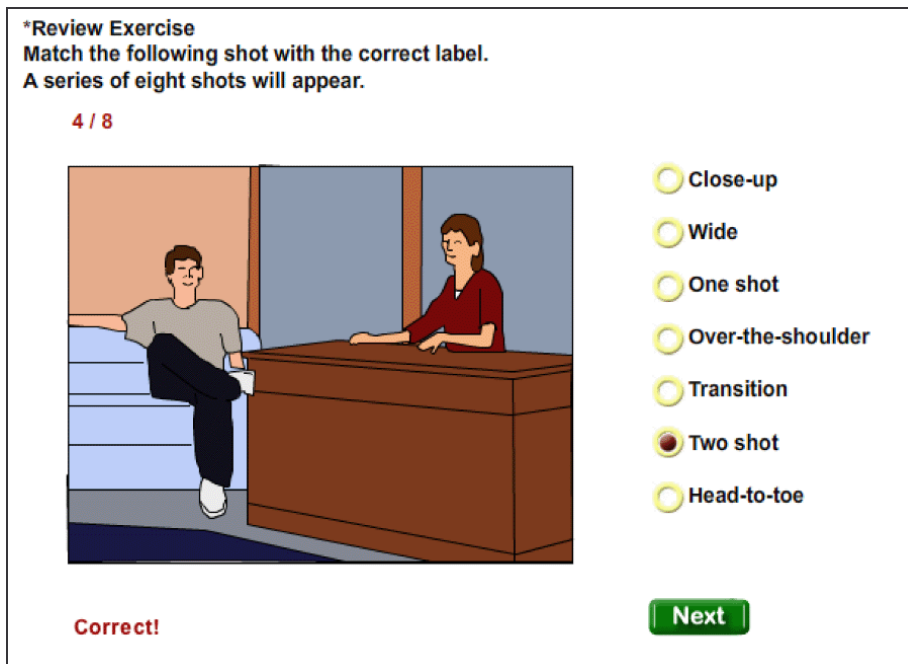
Figure 5. Screen shot of review exercise for types of shots in Framing Up Shots module.

The Movement module has five sections: (a) panning, (b) tilting, (c) zooming, (d) following, and (e) ped, truck, dolly. This module has the most animations of any module. For example, when explaining a proper zoom, the tutorial demonstrates how a proper zoom should appear in the viewfinder (see Figure 6). Review exercises ask users to test their recognition and understanding of (a) stage left and stage right, (b) anchored and non-anchored zooms, and (c) peding, trucking, and dollying (see Figure 7).

Focus has two sections: (a) focus; and (b) back focus. An animation demonstrates what users should see in the viewfinder while focusing their camera (see Figure 8). Review exercises cover the process of setting the camera's focus, adjusting the back focus, and focusing in the proper direction (see Figure 9).
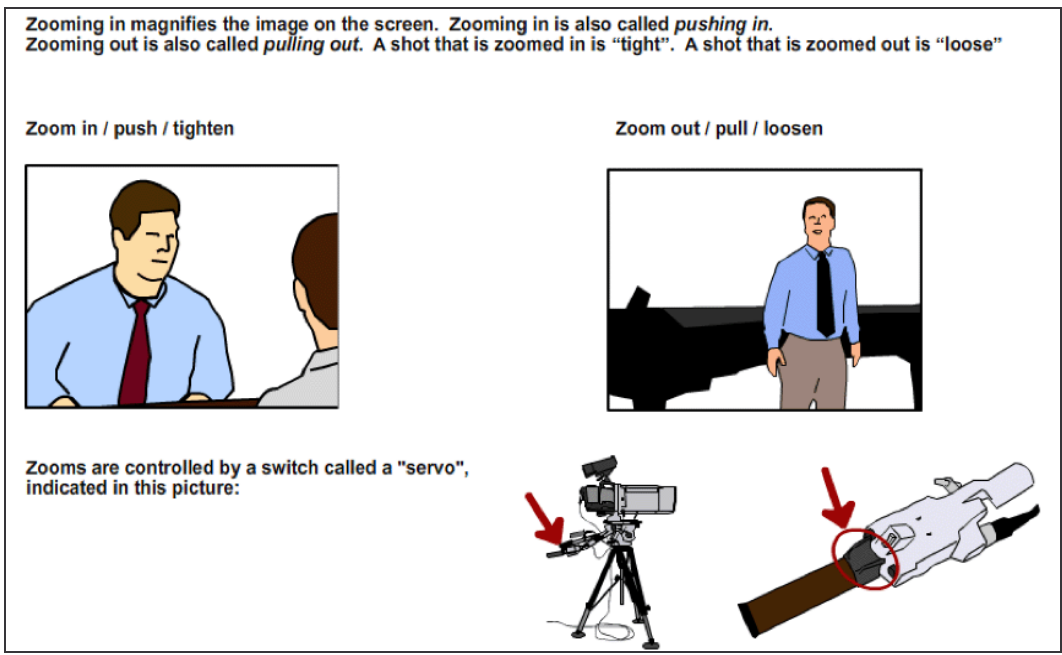
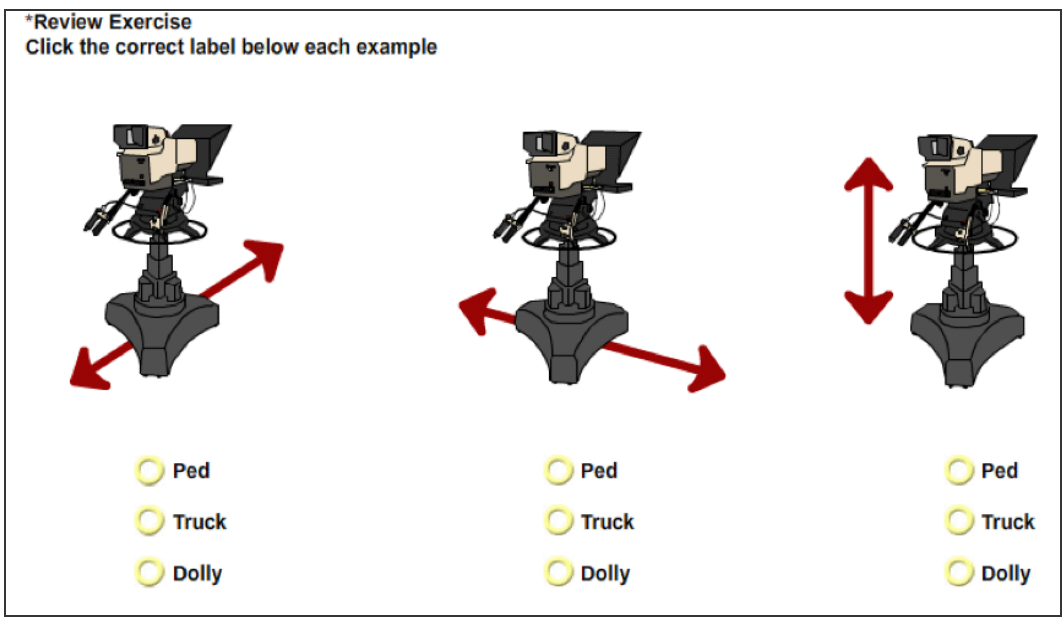*Figure 6*. Screen shot of zooming explanations from the Movement module.

Figure 7. Screen shot of a review exercise from the Movement module.
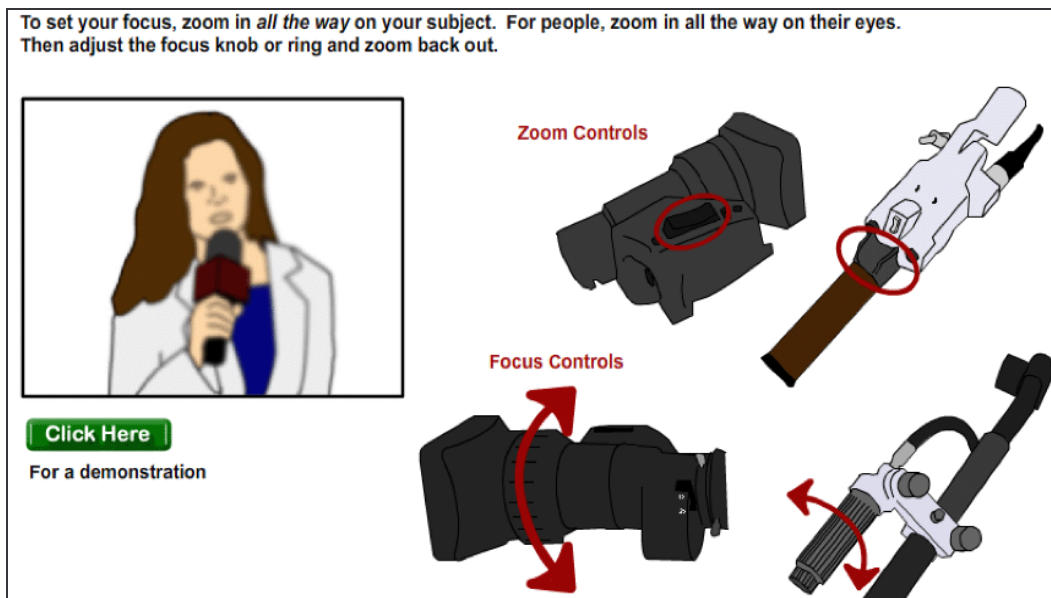
Figure 8. Screen shot of focus demonstration in Focus module.
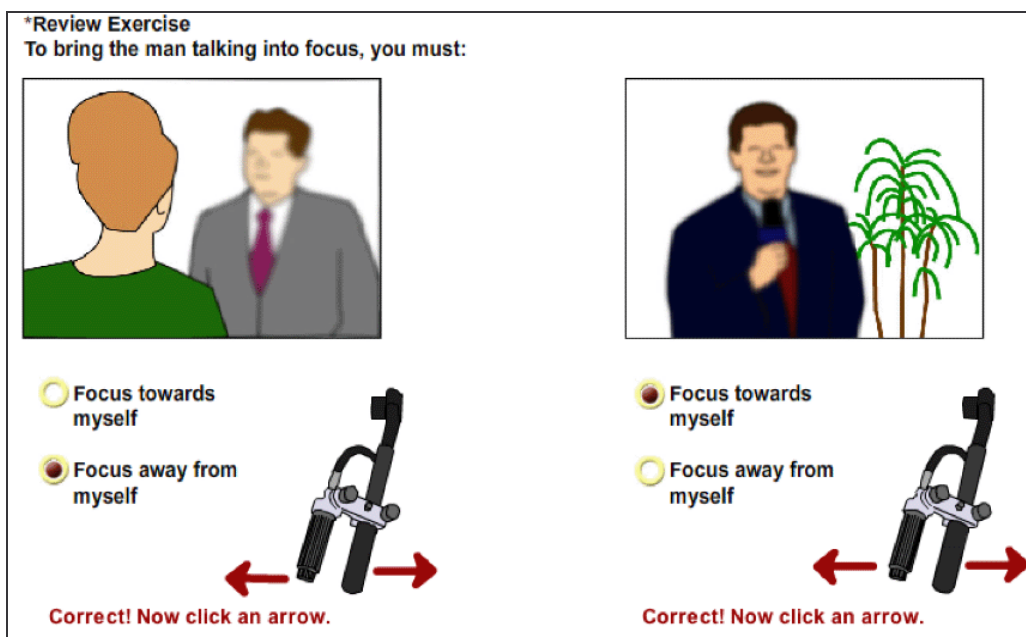
Figure 9. Screen shot of focus review exercise in Focus module.

Camera Controls has four sections: (a) tripod head; (b) zoom & focus controls; (c) the camera; and (d) viewfinder. Although the module has only seven pages, it contains a large amount of information and review exercises with multiple items. The first five pages contain interactive descriptions of each control covered in the module. Users click on control names to see their location and read a description of their functions (see Figure 10). The sixth page has a review exercise asking users to click on the location of each control (see Figure 11), and the seventh page asks users to click on the location of a control when given a description of its function (see Figure 12).

Figure 10. Screen shot of instruction from Camera Controls module.
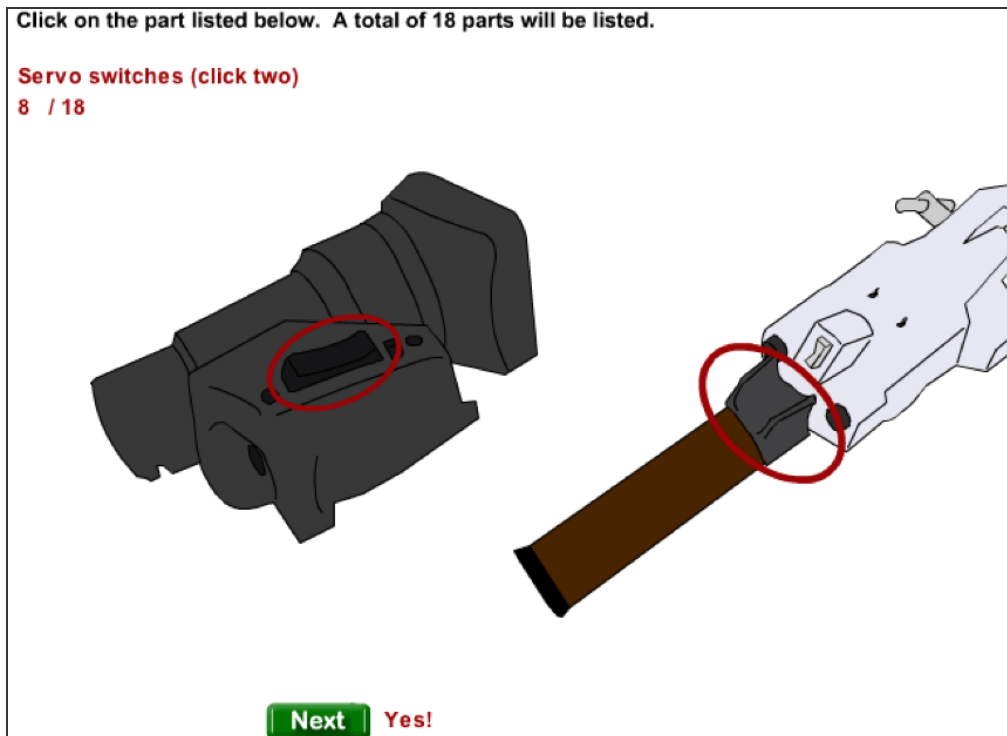
Figure 11. Screen shot of control review exercise from Camera Controls module.
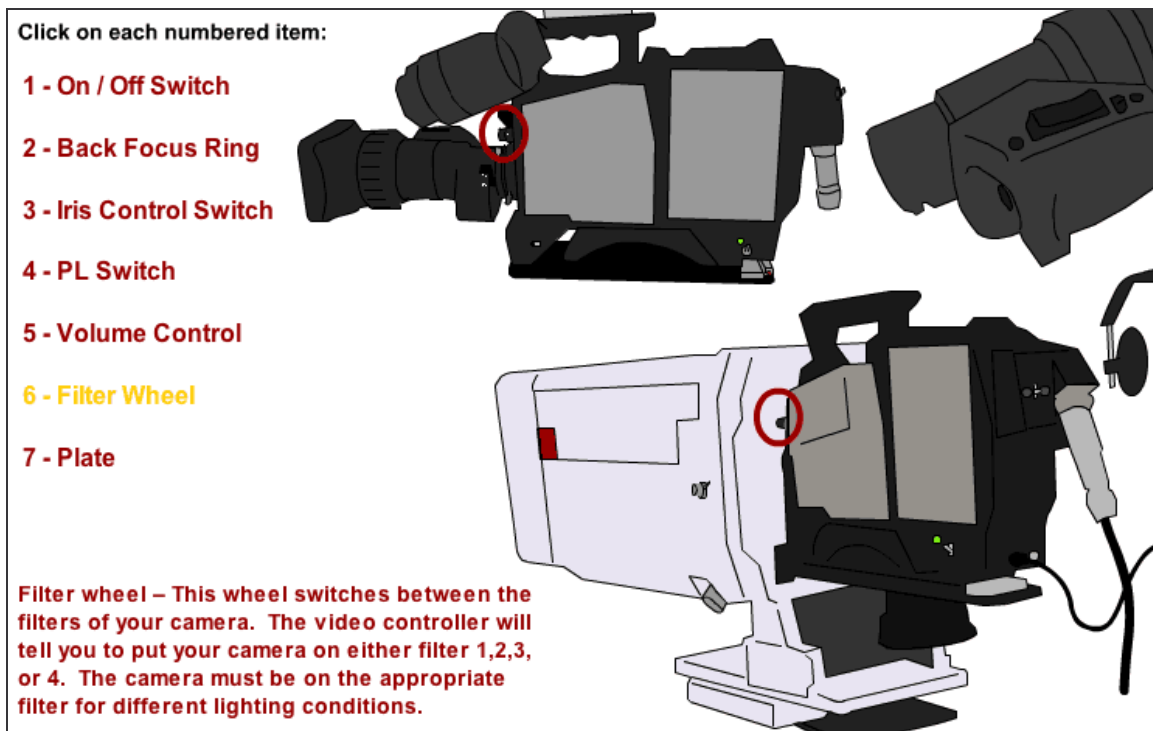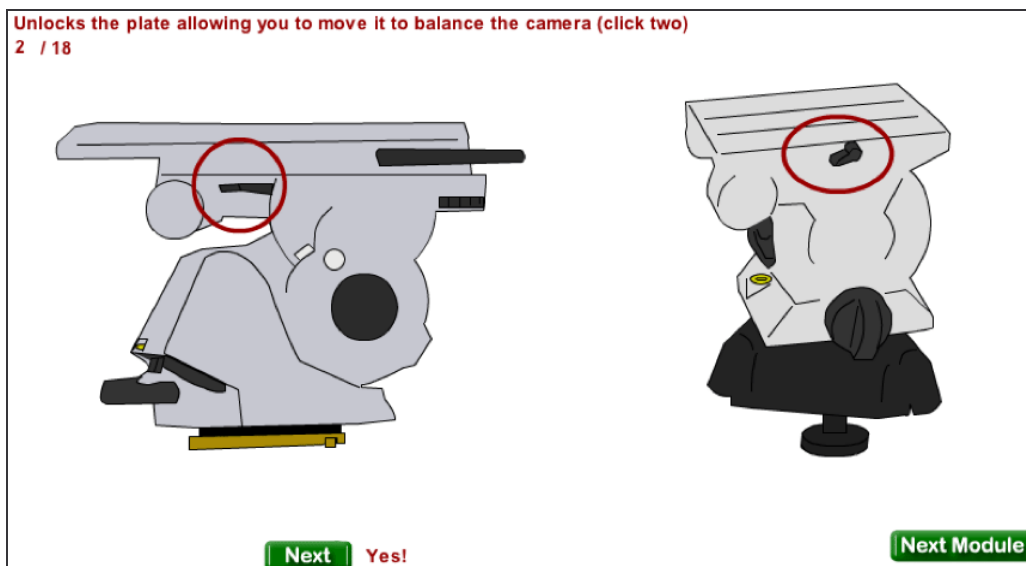

Figure 12. Screen shot of control review exercise from Camera Controls module.

Camera Setup has six sections: (a) leveling the camera, (b) balancing the camera, (c) avoiding hazards, (d) cable care, (e) white balance, and (f) FAX. Graphics and animations demonstrate concepts such as leveling the tripod head, adjusting white balance, dealing with cables (see Figure 13) and balancing the camera's weight (see Figure 14). Review exercises cover steps for balancing cameras, setting white balance, avoiding obstructions and hazards, properly caring for cables, and participating in a FAX ("Full Auxiliary Check") before each broadcast.

Treat cables with care.
- Don't drag the connectors across floors.
This damages the connectors.

- Don't drag the cable around sharp corners.
This damages the cables.
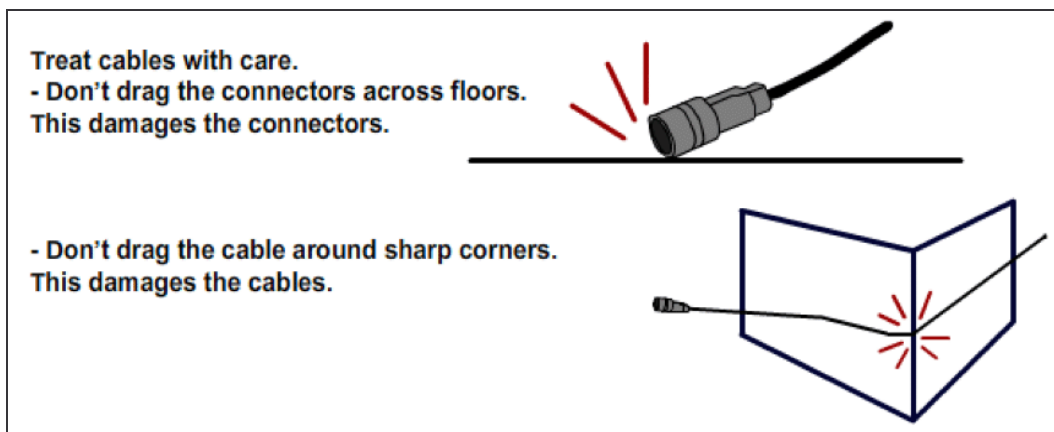
Figure 13. Screen shot of cable instructions from Camera Setup module.

If it tilts foward, you must slide the camera back.

Figure 14. Screen shot of animation from Camera Setup module.

Users should be able to complete the tutorial in about one hour. I estimated that this would be the time needed to cover the content, and rapid prototyping sessions appeared to confirm this estimate.

Assessment Materials

The assessment consists of an online test with 30 items—either multiple choice, matching, fill-in-the blank, or questions requiring users to click and drag graphics to demonstrate understanding and application. A button labeled "Finished" allows users to proceed to the next question (see Figure 15). Users may not return to previous questions. The test is automatically scored out of 30 points. Correct items earn one point; incorrect items earn zero points. The final page of the test (see Figure 16) displays users' scores out of 30, and a list of modules that users should review to improve their score.
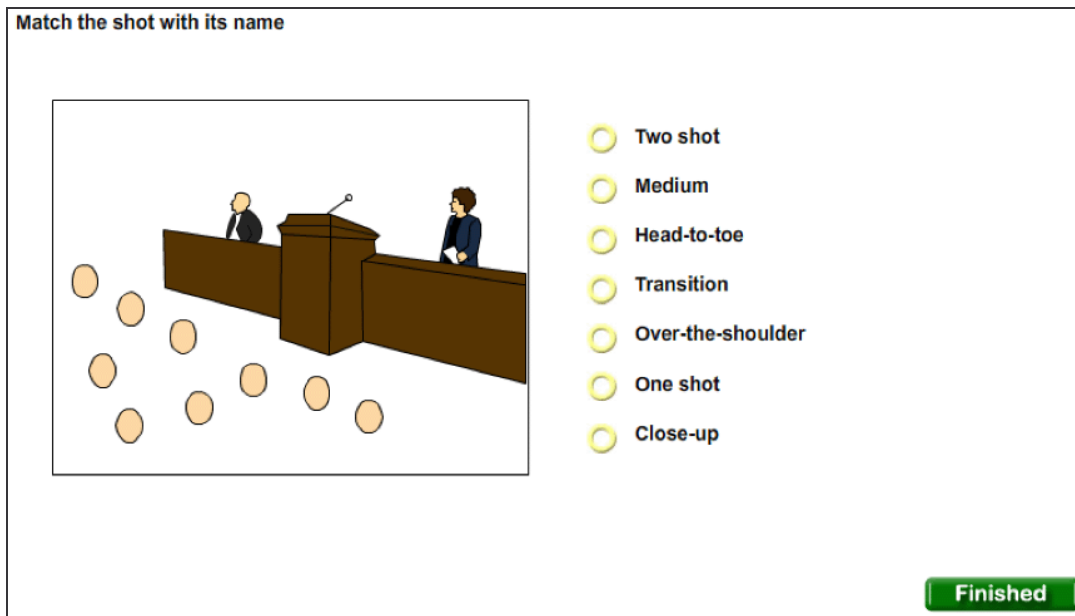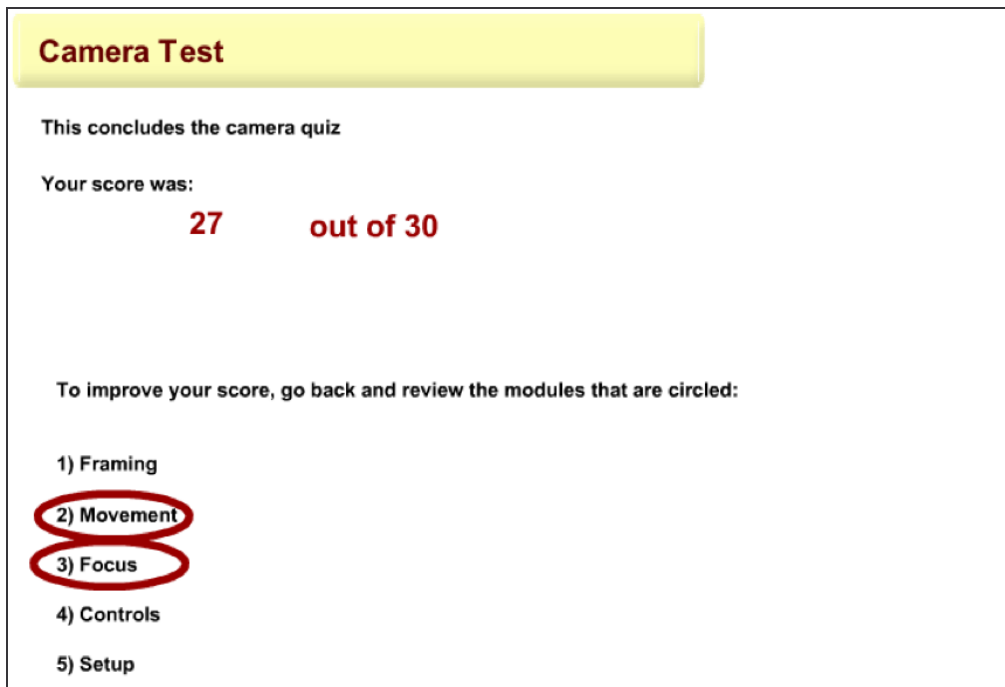
Figure 15. Screen shot of test question with "Finished" button.

Camera Test

This concludes the camera quiz

Your score was:

27   out of 30

To improve your score, go back and review the modules that are circled:

1) Framing

2) Movement

3) Focus

4) Controls

5) Setup

Figure 16. Screen shot of results page of the test.

Not all objectives are measured by this test. After the audience and needs analyses I wrote a list of over 60 test items that measured every objective. However, during rapid prototyping sessions, it became apparent that I was asking too much for users to learn the information for all 60 items. So I narrowed the test to 30 items that covered the most relevant objectives. I estimated the relevance of the objectives based on what I observed during needs and audience analyses regarding the most common skill deficiencies. For example, the names and functions of a few camera parts such as the plate and safety zone were not as crucial as knowing how to unlock the camera and turn on the microphone to speak to the director. Rapid prototyping participants also found 30 to be a more reasonable number than 60.

Evaluation

Design

The evaluation of the tutorial occurred in four phases: (a) script rapid prototyping, (b) interface rapid prototyping, (c) tutorial rapid prototyping, and (d) field test. These evaluation activities yielded both qualitative and quantitative results. Qualitative results included questionnaire and interview information from rapid prototyping and field test participants. Quantitative results include pre- and posttest scores for the field test. Each evaluation phase is described below.

Script rapid prototyping. I showed portions of the script to six people, including both subject matter experts and target audience members. While reviewing the script with subjects, I asked questions about the tutorial's clarity, organization, navigation, appropriateness, and any other concerns that the participants mentioned. Each of these reviews was followed by revisions to the script.

Interface rapid prototyping. I decided to conduct this separate phase of the evaluation while creating the actual prototype. After spending considerable time developing an interface shell with design and navigation features, I concluded that it would be helpful to test the interface and make revisions before adding the content. The interface was tested with three subjects who were asked about the aesthetic appeal and functionality of the interface. Each test-out was followed by revisions.

Prototype rapid prototyping. Four participants, including both subject matter experts and target audience members, tested at least the majority of the working tutorial. For most subjects I asked questions about the tutorial's clarity, breadth, length, sequence, appropriateness, and other strengths and weaknesses. Originally I planned to use a

questionnaire, but discarded the idea after interviews provided sufficient feedback. Between each review I revised the prototype.

Field test. This phase began when the first three phases were complete and after the tutorial had undergone multiple revisions. The field test's design included a single sample with 11 subjects and a repeated measure of a pretest and posttest. A questionnaire was also administered after the posttest. The questionnaire measured stakeholders' concerns, including users' opinions about the tutorial's (a) navigation, (b) organization, (c) amount of information, (d) appropriateness as a learning tool, and (e) other strengths and weaknesses. The field test was to include a follow-up interview, but logistics prevented me from being present while the students participated, so my data includes only pre- and posttest scores and the questionnaire results. Participants included volunteers from television production courses and other BYU students or BYU Broadcasting employees wishing to participate. Their only compensation for participation was a complementary chocolate bar and the chance to learn some new skills.

During the analysis of the field test data, I computed the means and standard deviations of the pre- and posttest scores and conducted a repeated measure *t*-test using *p* < .05 as significant. Since the *t*-test only indicates the existence of an effect, I also computed the effect size for the pretest and posttest means using the standard deviation of the pretest. This value was intended to explain the strength of the effect. I interpreted the effect size using Cohen's criteria (*d*), where 0.2 is considered a small effect size, 0.5 a medium effect size, and 0.8 a large effect size (Cohen, 1992).

Instrumentation

The field test participants took an online test for the pretest and posttest. The same questions were used for both pre- and posttests, which were the questions

developed for the tutorial's assessment (see Appendix B). The questionnaire (see

Appendix C) was also delivered through the Internet. By using radio buttons, it asked the

user's (a) gender, (b) age, and (c) background experience. It also asked for their opinions

of the tutorial's (a) effectiveness, (b) delivery method, (c) amount of information, (d)

organization, (e) navigation, and (f) whether future tutorials would be appropriate. The

questionnaire contained several textboxes for additional written feedback, and a function

to automatically email the results to my email address.

Results and Analysis

 Script rapid prototyping. For this rapid prototyping phase, I used drafts of the

script with low-fidelity drawings, outlines, and diagrams, as demonstrated below in

Figure 17. The drafts were created using Microsoft Word, Paint, and Adobe Photoshop.

1A - The Rule of Thirds

The shot to the right looks more visually appealing because it keeps its subject out of the center of the frame and allows the subject to fill up more of the shot. Our eyes tend to avoid lingering on the center of the frame, so it's important to keep the subject out of the center.

1A - The Rule of Thirds

This is known as the Rule of Thirds. We place the main subject about one third down from the top of the frame, and about one third over from the side of the frame.
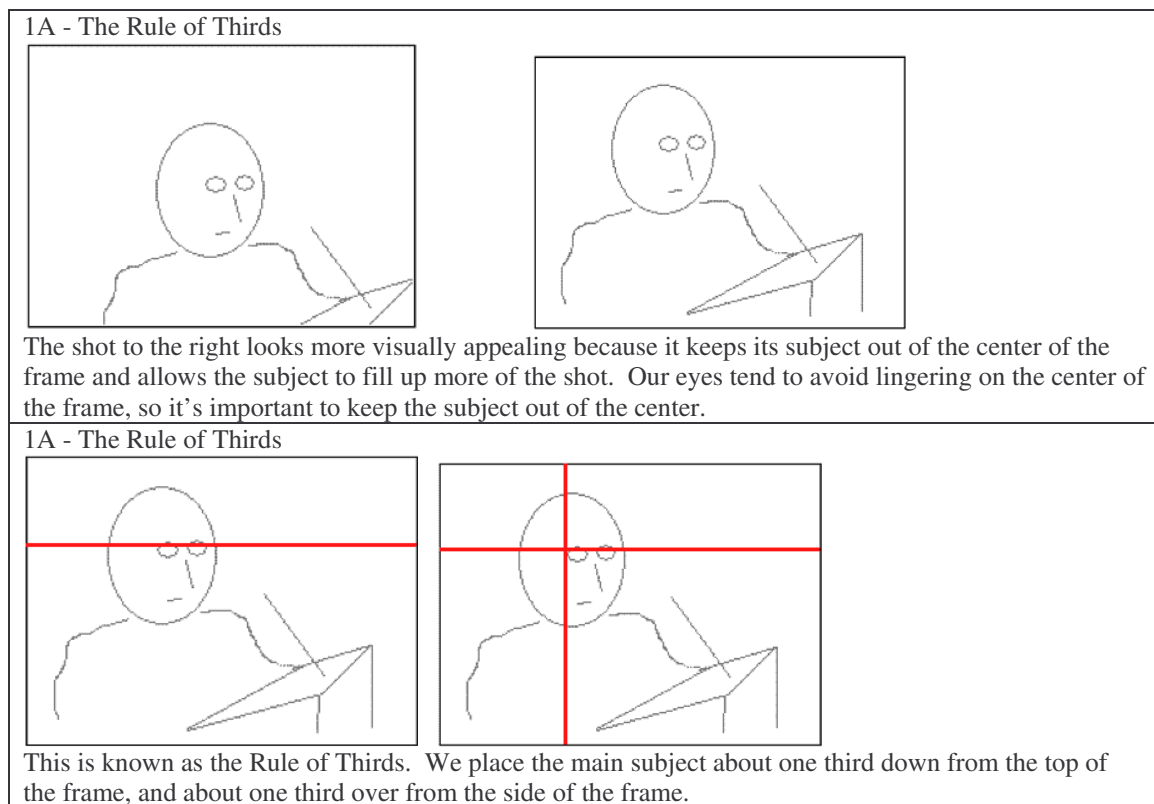
Figure 17. Examples of rapid prototyping scripts.

The first rapid prototyping session occurred on November 5, 2005 with a subject with no experience in camera operation. She discussed the review exercises spread throughout the tutorial, especially how they should occur at regular intervals, including the ends of each module, and how they should more closely mirror the test. From her comments I incorporated review exercises with more consistency. She recommended devising a method for users to access only the review questions, skipping the rest of the tutorial. This idea intrigued me, and I considered including it, but did not incorporate it because of constrained scope.

On November 8, 2005 I reviewed the script again with the primary stakeholder, Duane Roberts. We discussed the order and organization of the modules, leading me to consolidate and reorder modules to create a logical flow of information. For example, he advised against a separate module for types of shots, recommending instead including this content within the framing module. He also recommended placing all of the framing material before the movement material. This organization stayed relatively intact throughout the remainder of the tutorial's design and development. Duane wanted a large database of questions from which to draw for the test, so each version of the test would use different items to assess the same objectives. This would have been an effective approach to assess learning, but time and resource constraints prevented its development. He indicated which issues he wanted evaluated—navigation, user interface, the time it takes to complete, and whether students can perform well on the test on the first go-through. He also wanted some confirmation if this is a good approach to teach this material, or if other approaches may be better.

I reviewed my instructional objectives and test questions with Dr. Richard Sudweeks from the BYU Instructional Psychology and Technology department on

November 17, 2005. He helped me improve the wording of several objectives and questions. A significant improvement involved questions requiring users to reorder listed items. Per his recommendation, I shortened these lists to five items, providing instructions to use numbers one through five for ordering the items. I also improved the matching questions by giving more clear instructions and using uneven lists of items to match.

After making revisions based on previous feedback, I completed another rapid prototyping session with a student target audience member on November 22, 2005. We focused on the Camera Controls and Setup modules because I felt that these modules had not received as much attention in previous sessions. He recommended numbering and sub-numbering modules and sections in a consistent, logical manner and including vocabulary lists at the beginning of each module. He also recommended more clearly defining the objectives of each module and standardizing the definitions. He made further recommendations to create interactive exercises about balancing the camera that I could not complete due to a constrained scope.

After revisions, another male target audience member reviewed the entire script on December 1, 2005. Although he liked the casual, encouraging language of the tutorial, he suggested consistent explanations of the theory behind many of my statements—especially why a shot "looks good" or is "more visually interesting." Writing these additional explanations proved challenging. I eventually settled on terminology such as a poorly-framed shot makes the subject appear 'framed in' or 'diminished in stature.' My subject also suggested referring to camera controls periodically throughout every module to offer more review and thematically connect modules. For example, when I teach about proper zooms, I include a brief reference to

the location of the zoom controls. He confirmed that the controls module is one of the most challenging modules, and he liked my decision to explain the technical information after the conceptual information. He would have also preferred a printed job aid to accompany the tutorial, which I was not able to complete.

I revised the script again and asked a subject matter expert to review it on December 5, 2005. His review was brief; however, he liked the organization of topics and suggested a visual cue to remind users how far they have progressed in the tutorial. This cue is provided by the navigation bar (see Figure 18). The remainder of his suggestions included wording improvements. By now I felt that the script was reasonably complete, so I began working on the computer-based prototype.

Interface rapid prototyping. I initiated production by creating the user interface using Macromedia Flash and Adobe Illustrator. The interface included a navigation bar, title bars, page numbers, and forward and back buttons (see Figure 18). I kept elements in the same location on the screen to enhance usability, according to typical good design principles (Keirns, 1998).

Three volunteers, including two target audience members and one former target audience member, looked at the interface and gave feedback. I asked about its visual appeal, navigation, and other strengths and weaknesses. The first subject wanted the interface to look more engaging, with more colors and dimensionality. The second subject suggested more consistency to the design. The third subject suggested further consistency and clarity by rounding all edges and repeating the word *page* next to the page numbers. From these test-outs I concluded that users want a clear, consistent, and engaging interface.
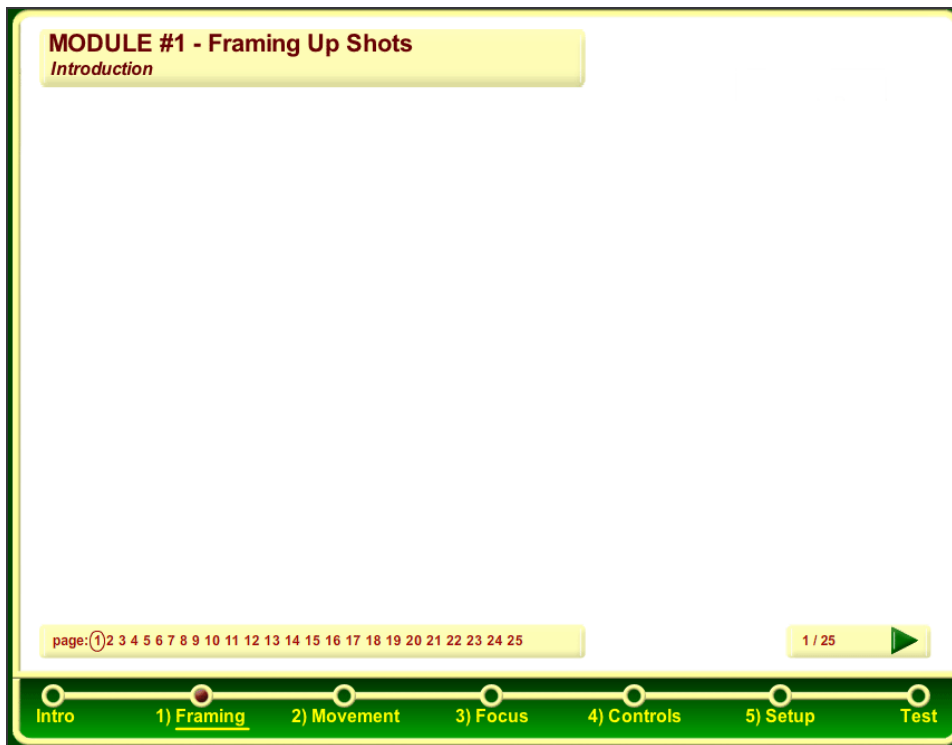
Figure 18. Screen shot of tutorial's interface.

Prototype rapid prototyping. After completing a draft of the prototype with most content and functions complete, I tested it with a former target audience member on March 13, 2006. She spent about one hour and ten minutes finishing the tutorial alone but not taking the test. Her time was lengthened because she took notes, so it appeared that my one hour estimate was reasonable, if slightly low. Most of her comments were minor, dealing with wording, cosmetics, clarity of illustrations, and a few technical glitches such as buttons that were difficult to click. Some of my animations played once and stopped. My subject wanted them all to continue playing to reinforce the principles that they demonstrated. For review exercises in the controls module, she kept clicking on the exercise until she found the control through trial and error. I therefore limited the number of clicks to find the correct part to four. She said that the tutorial was "totally

worth my time," although she felt that my original list of 60 test questions was too long. From her feedback, I limited it to 30 items. When I asked if a printed supplementary job aid would be appropriate, she responded enthusiastically.

The next subject to review the tutorial was Dr. Paul Merrill from the Instructional Psychology and Technology department. Overall, he found the tutorial very good, and liked the review exercises to give the students more practice. Most of his suggestions involved wording improvements and adding elements that I had planned in the paper script but had not yet implemented. For example, he suggested review exercises and test questions to all use un-encountered examples, which I had planned in the script. I added several un-encountered items during revisions, although I was not able to include as many un-encountered items as I had anticipated.

The last two subjects to take the tutorial were subject matter experts at BYU Broadcasting. Both had extensive professional experience in television production and directing. They responded very enthusiastically to it, claiming that it would be very useful. They gave only a few minor suggestions to improve some descriptions. Both took the test, one of them scoring 25 and the other 29 out of 30 possible. At this point I felt that the tutorial was ready for the field test.

Field test. Eleven people participated in the field test—ten students and one full-time employee at BYU Broadcasting. Seven student participants were enrolled in television courses at BYU, which suggested their interest in television similar to many BYU Broadcasting student employees. Ages ranged from 10 to 44 ($M = 24.73$). Four were female and seven were male. Pretest scores ranged from 7 to 17; posttest scores ranged from 18 to 29. Descriptive statistics are listed in Table 1.

Table 1

Descriptive Statistics for the Field Test Data

Test Occasion	Mean	Standard Deviation
Pretest	10.55	3.39
Posttest	23.36	3.47
Gain	12.82	3.16

Even with this small number of participants, a repeated measure *t*-test indicated that the increase in test scores was significant, $t(10) = 13.47$, $p < .05$. The effect size also showed a large effect, $d = 4.06$. Based on these quantitative results, the tutorial appears to effectively increase the test scores.

The questionnaire (see Appendix C) asked users to select responses from a scale of three or five options and write further explanations in a textboxes. The results as a whole (see Appendix E) were mostly positive, as summarized below next to each question.

Overall, how would you rate the effectiveness of this tutorial? Seven participants marked the tutorial as *very effective*, the highest on the scale, and four marked it as *fairly effective*, the second highest. The most common concerns expressed in the written feedback involved the clarity of some of the illustrations.

This tutorial is designed to train new camera operators who have no opportunities for hands-on training before their first day. Assuming no hands-on training is available, would you recommend a different method to train camera operators? (e.g. a printed manual, a video, etc.) Nine participants marked *No*, and two marked *Maybe*, writing suggestions that an extra video and printed manual would be helpful.

How do you feel about the amount of information in the tutorial? Six participants selected *Had the right amount of information*. Five selected *Had somewhat too much information*.

How logical was the organization and sequence of units and sections? Six participants selected *Very logical*, the highest option in the scale, and five selected *Fairly logical*, the second highest option.

How clear was the navigation to understand and follow? Eight selected *Very clear*, the highest scale option, and three selected *Fairly clear*, the second highest option.

Do you believe that similar tutorials about other topics in television production would be appropriate? Eight participants selected *Yes*, and three selected *Maybe*. Participants who selected *Maybe* wrote that hands-on training approaches should be used whenever possible.

After the field test I made a few revisions, including improving the clarity of some illustrations and creating a few more un-encountered examples for the review and test.

<div align="center">Conclusion</div>

Critique

My primary stakeholders—the full-time directors and producers who work with BYU Broadcasting student employees—were pleased and excited about the revised tutorial. It covers a lot of material, automatically assesses learning outcomes, and provides interactive exercises to reinforce learning. One of its strengths is how the interactive elements teach principles that some may consider challenging to teach through automated instruction. When students operate a real camera, for example, they need to be able to glance at a model and locate a switch or knob, and the tutorial requires them to

examine a picture and click on the appropriate switch or knob. Students also need to intuitively frame up good shots, not just recognize good shots. The tutorial requires them to demonstrate how to frame up shots.

The evaluation, although modest in some respects, proved worthwhile. The multiple test-outs during the evaluation led to multiple improvements in the final product, strengthening the claim of the tutorial's effectiveness. Since many of these rapid prototyping test-outs occurred with paper-based drafts, I was able to work out many problems which would have been much more time-consuming to change in the computer-based version. During the field test, the prototype had been improved sufficiently that the feedback involved relatively minor changes. I did not have to re-arrange or add entire sections of content or drastically alter my instructional strategies. The field test also demonstrated that students generally will not perform well on the test without first taking the tutorial, and that the tutorial significantly increases test scores.

The tutorial also has many weaknesses, some of which were previously mentioned. The main weaknesses are summarized below:

1. No printable job aid is available to help students extend and transfer what they learned. This is a significant drawback that several users indicated would have been helpful.

2. The illustrations do not represent all camera models. Given the large number of models and continual release of new models, it would be impossible to represent all models. However, I could have included a wider variety of models in the illustrations.

3. Pictures are hand-drawn illustrations, not photographs, which may be more difficult to relate to the physical world. I created the vector-based drawings to

decrease bandwidth and to clearly represent objects and principles without
unnecessary details of photographs. Some users liked these illustrations, but
others thought that they could be improved.

4. Users cannot review the review exercises separately from the rest of the
tutorial. This option would have helped users prepare for the test.

5. Some review and test items do not have un-encountered examples. The large
amount of time necessary to create the drawings prevented me from creating
all un-encountered items.

6. The test scores cannot be automatically emailed to a supervisor. I had planned
to program this function into the tutorial, but scheduling constraints prevented
me from completing it.

7. The evaluation did not examine data on individual test questions. These data
would have been very useful to improve test questions, particularly since no
participants or subject matter experts scored a perfect 30 on the test. There
may be one or more questions that should be changed or discarded. Again,
schedule constraints prevented me from programming the evaluation posttest
to gather the data.

8. The field test had no control group, randomized selection, or different
versions of pre- and posttests. An ideal evaluation would have used many
more randomly-selected participants in a Solomon four-group design that
controlled for confounding variables like the effects of the pretest on the
posttest. This design would have ruled out testing effects or maturation as
causes for the increase in the test scores. The design could have also utilized
different versions of pre- and posttests that measure the same concepts.

These different versions would have strengthened evidence that students learned the concepts instead of just memorizing answers to questions from the pretest. However, even though this design would have strengthened my conclusions, it would have likely not fundamentally altered my conclusions. The difference between my current pre- and posttest scores using one sample was significant, and the effect size was large. It is unlikely that adding more subjects and a control group would have reversed my conclusions, demonstrating instead that the tutorial was not effective.

9. The evaluation did not assess the transfer of knowledge by assessing student performance with real cameras. This was another major drawback of the evaluation, which was prevented because of limited scope.

10. The test's passing grade was never determined through a standard setting procedure. The stakeholders will need to determine a cut-off score for students to pass the test. It would have been helpful to determine a passing grade using a procedure similar to the bookmark standard-setting procedure, but limited time prevented me from incorporating this step into the project. However, the range of posttest scores provides a range of scores to expect on the posttest, which will help the stakeholders estimate a passing grade.

Many of these drawbacks stemmed from my ambition overreaching my resources. I lacked the time to address many of these concerns, and without a budget I could not hire additional help. Creating the interface and every graphic by hand in Macromedia Flash and Adobe Illustrator allowed maximum control over the appearance, although it was more time-consuming than using more automated course-creation software. Volunteers for the evaluation were asked to participate with no compensation other than chocolate

bars and the chance to learn new information, so it was difficult to solicit much of their time.

The supervisor of all student production employees at BYU Broadcasting has expressed interest in creating further tutorials for his students. Based on the field test results, it appears that students would like additional tutorials. However, based on my experience I would make the following recommendations for another tutorial:

1. Use more efficient course creation software such as Lectora by Trivantis instead of Macromedia Flash. Lectora does not require as much hand-coding as Flash, allowing developers to add interactivity and test questions with a few mouse clicks instead of typing ActionScript.

2. Create printable job aids to assist learners. Ensure that the budget and schedule allow for their creation.

3. Use more compressed photographic images such as jpegs or pngs instead of only hand-made vector-based graphics. The vector-based graphics may effectively represent some complicated scenarios and concepts because of their simplified design; however, many of the concepts in television production are simple enough not to require line drawings. Photographic images would suffice to teach the concepts, and would require less work to create.

Schedule

The schedule that I drafted during the initial planning stages of the project was based on the assumption that I would spend approximately ten hours per week on the project. The projected and actual completion dates for major tasks are listed in Table 2.

Table 2

Projected and Actual Completion Dates of Major Tasks

Task	Projected Completion	Actual Completion
Audience Analysis	10 / 21 / 2005	10 / 24 / 2005
Literature Review	10 / 21 / 2005	10 / 24 / 2005
Deliver Design Document	11 / 01 / 2005	12 / 05 / 2005
Deliver Paper Prototype	11 / 18 / 2005	12 / 05 / 2005
Complete First Working Prototype	01 / 09 / 2006	03 / 13 / 2006
Complete Rapid Prototyping	02 / 17 / 2006	03 / 31 / 2006
Complete Field Test	03 / 17 / 2006	05 / 15 / 2006
Submit Project Report	04 / 14 / 2006	06 / 01 / 2006
Deliver Tutorial	04 / 14 / 2006	06 / 01 / 2006

The largest discrepancy occurred between the projected and actual completion dates of the first working prototype. This discrepancy stemmed from two main reasons. First, I was not able to continue my pace of 10 hours a week due to exams and unforeseen circumstances, and second, working with Flash and Illustrator proved to be more time-consuming than I had anticipated. I also began full-time employment February, which further slowed the process. However, these dates aside, the actual hours spent on the project show a more favorable picture.

Final Budget Report

There was no money available to recompense my work on this project, so the budget was measured in hours, with the projected costs estimated based on estimated hourly rates. Project and actual expenses are portrayed in Table 3. In spite of the

weaknesses of the tutorial, I finished in less than 2% over the hours planned for the

project, and 6% under the estimated budget.

Table 3

Projected and Actual Expenses for the Project

Item:	Rate ($/hr):	Projected		Actual	
		Number	Cost ($)	Number	Cost ($)
Audience / needs analysis	10.00	30	300	38	380
Write objectives	10.00	5	50	5	50
Write assessment	10.00	10	100	8	80
Write instruction	10.00	20	200	26	260
Rapid prototype storyboard	10.00	15	150	7	70
Write design document	10.00	8	80	2	20
Design interface	10.00	15	150	15	150
Rapid prototype interface	10.00	10	100	2	20
Create prototype tutorial	10.00	70	700	120	1200
Rapid prototype tutorial	10.00	20	200	25	250
Prepare & conduct field test	10.00	15	150	16	160
Revise tutorial	10.00	20	200	10	100
Audience analysis student hours	7.00	10	70	6	42
Needs analysis employee hours	18.00	10	180	5	90
Rapid prototyping employee hours	18.00	10	180	3	54
Consultation with committee	25.00	20	500	9	225
Participant hours for field test	10.00	15	150	11	110
SUBTOTAL – hours worked		303	3460	308	3261
Computer printouts	.05	800	40	400	20
Appreciation gifts for volunteers	2.00	15	30	8	8
TOTAL COST:			$3380		$3179

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Appendix A

Learning Outcomes.

After completing the tutorial, the learner will be able to:

1. Apply principles of framing up camera shots

    a. Differentiate between examples and non-examples of the rule of thirds in previously un-encountered camera shots

    b. Apply the principle of the rule of thirds to correct poorly-framed camera shots

    c. Apply the principle of avoiding distracting background elements to correct previously un-encountered camera shots

    d. Identify all key aspects of proper on-air zooms

    e. Identify all key aspects of proper on-air pans

    f. Discriminate between good and poor examples of the following in previously un-encountered shots:

- Head room
- Nose room
- On-air pans
- On-air zooms
- Following a moving object

    g. Identify appropriate shots to frame up based on what is present in the camera return

2. Recognize the following types of camera shots

    a. Classify examples of shots into the following categories

- close-up
- medium
- head-to-toe
- wide
- transition
- over-the-shoulder
- one shot
- two shot

    b. Correct the framing of previously un-encountered examples of the following

shots:

- close-up
- medium
- head-to-toe
- wide
- transition
- over-the-shoulder
- one shot
- two shot

    c. Classify un-encountered examples of peding, trucking, and dollying

3. Focus the camera lens appropriately

    a. Recognize the location of the focus ring for multiple camera models

    b. Identify the procedure for setting camera focus

    c. Predict which way a focus ring must be rolled in order to bring a previously un-encountered subject into focus

    d. Recognize the location of the back focus ring

    e. Correctly arrange the order of tasks for adjusting back focus

4. Identify the location and function of camera controls

    a. Identify the location on various camera models for the items listed below and

    b. Recognize the function of the items

- Plate lock
- Plate wheel
- Bubbles
- On/off switch
- Back focus ring
- Iris control switch
- Zoom control
- Zoom speed control
- Head locks
- Return button
- PL switch

- Filter wheel
- Extender
- Tally light
- Safety zone

5. Recognize specific procedures for setting up cameras

    a. Identify possible obstructions & hazards for un-encountered examples of cameras and tripods

    b. Identify situations in un-encountered examples where triax cable needs to be dressed

    c. Identify which triax connector connects to the camera

    d. Recognize when an un-encountered lens needs to be cleaned

    e. Identify all key elements of a proper white balance

    f. Identify all key responsibilities for FAXing

    g. Correctly order steps for balancing the camera

Appendix B

Test Questions

Grab this shot with your mouse and move it until framed up according to the rule of thirds.
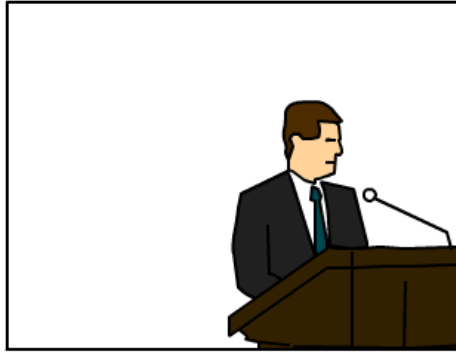
Grab this shot with your mouse and move it until framed up according to the rule of thirds.
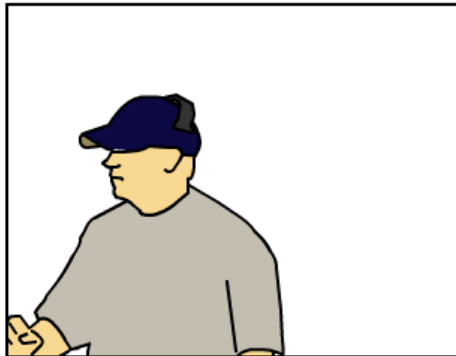
Match the shot with its name
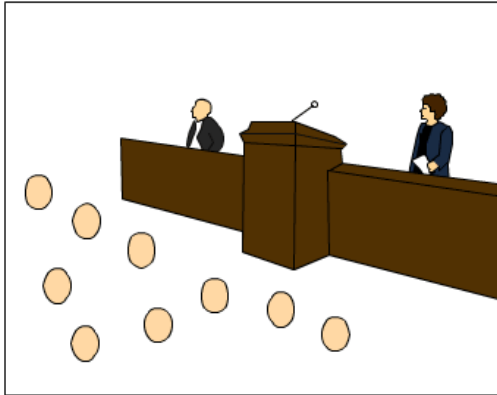
- Two shot
- Medium
- Head-to-toe
- Transition
- Over-the-shoulder
- One shot
- Close-up

Match the shot with its name
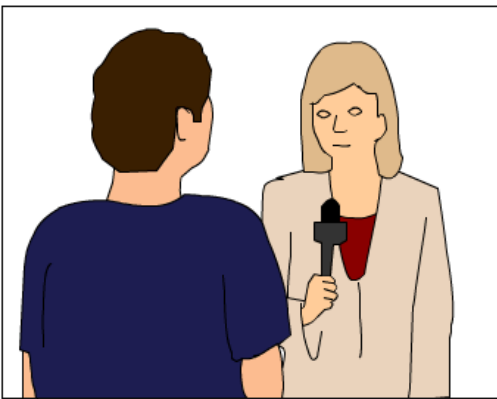
- One shot
- Medium
- Head-to-toe
- Transition
- Wide
- Over-the-shoulder
- Close-up
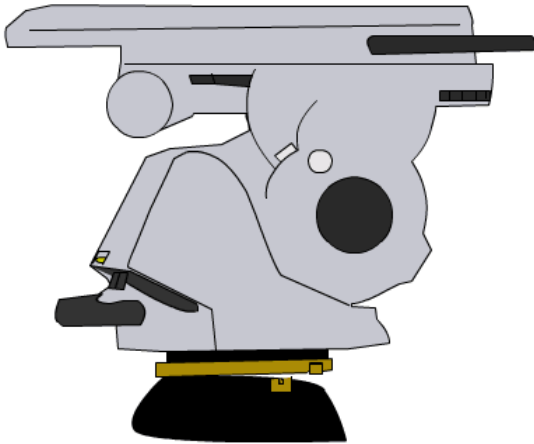
Match the shot with its name
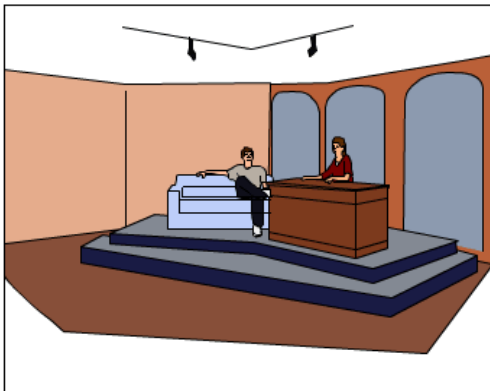
- Over-the-shoulder
- Two shot
- Head-to-toe
- Wide
- Close-up
- One shot
- Medium

Click the obstruction or hazard depicted below:

- ○ Tilt blocked
- ○ Pan blocked
- ○ View blocked
- ○ Head not secure
- ○ None
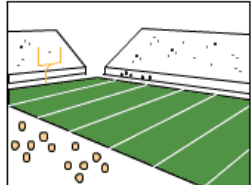
If you are shooting a football game, and you hear the talent say "The offensive coordinator has helped the quarterback develop an impressive game strategy." Your return shows the following shot. Click on the appropriate shot to frame up. You may click more than one shot.

Return:

Possible shots to frame up:

Click the buttons of the direction that these cameras are panning. *Select two buttons per example.*
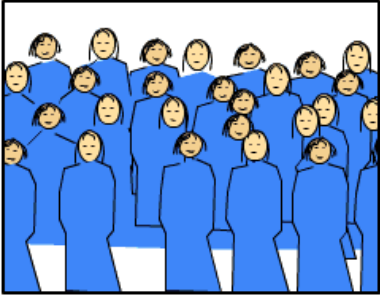
- ○ Camera Left
- ○ Camera Right
- ○ Stage Left
- ○ Stage Right
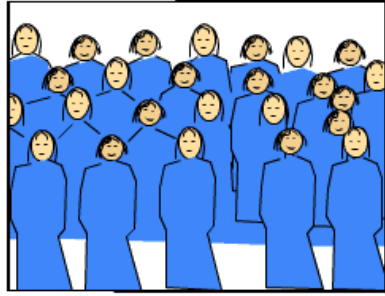
- ○ Camera Left
- ○ Camera Right
- ○ Stage Left
- ○ Stage Right

Indicate if these zooms are anchored.

- ○ Anchored
- ○ Not anchored
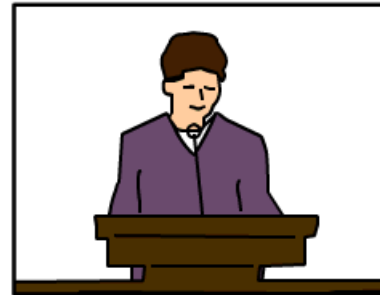
- ○ Anchored
- ○ Not anchored

Click the correct label below each example
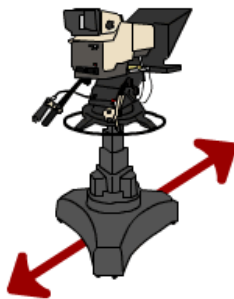
- ○ Ped
- ○ Truck
- ○ Dolly
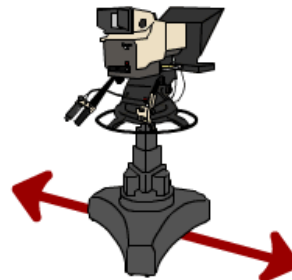
- ○ Ped
- ○ Truck
- ○ Dolly
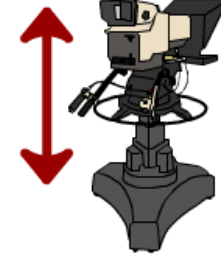
- ○ Ped
- ○ Truck
- ○ Dolly

Mark all items that are necessary to properly set your focus.

- ○ Roll your focus ring until the subject is in focus
- ○ Zoom in about halfway to your subject
- ○ Zoom in all the way on your subject's eyes or other distinguishing feature
- ○ Ask the director if your camera is in focus

To bring each of these men into focus, you must:

○ Focus towards
myself

○ Focus away from
myself
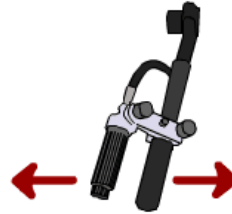
(Click an arrow for the
direction to focus)

Number the following tasks #1-5 in the correct order for adjusting back focus. Type the numbers in the blanks next to the tasks.

☐ Unlock your back focus ring

☐ Roll your back focus ring until the edges of your frame are in focus

☐ Zoom in and focus on a high-contrast object that is far away

☐ Lock your back focus ring

☐ Lock your camera and zoom out all the way out

Number the following tasks 1-5 in the most appropriate order for balancing the camera. Type the numbers in the blanks next to the tasks.

☐ Unlock the plate

☐ Level the tripod head and attach everything to the camera

☐ Turn the tilt friction and counter balance to "0" and check if the camera tilts

☐ Lock the plate

☐ Slide the camera forward or backward by pushing or using the plate wheel
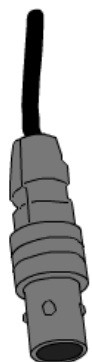
Click the obstruction or hazard depicted below:

○ Tilt blocked

○ Lens dirty

○ Pan blocked

○ View blocked

○ Camera not locked

Where do these triax connectors connect? Click one button for each.

○ Truck   ○ Truck
○ Camera   ○ Camera

What is necessary for a proper white balance as part of a camera crew? Mark all that apply.

○ Zoom in on something white

○ Press the white balance button

○ Turn off extender

○ Focus the camera

○ Adjust the iris

During FAX, you should: (mark all that apply)

○ Stay on your headset until you are released

○ Report to the technical director if your return and tally light are working

○ Not report any problems because by then it's too late to fix anything

○ Report any problems with your camera

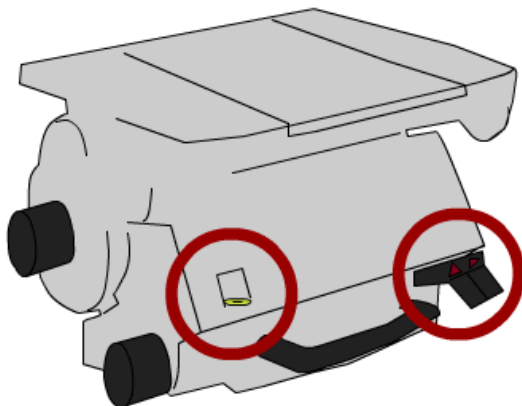○ Only test the tilt, pan, focus and zoom because the engineer checks everything else

---

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.
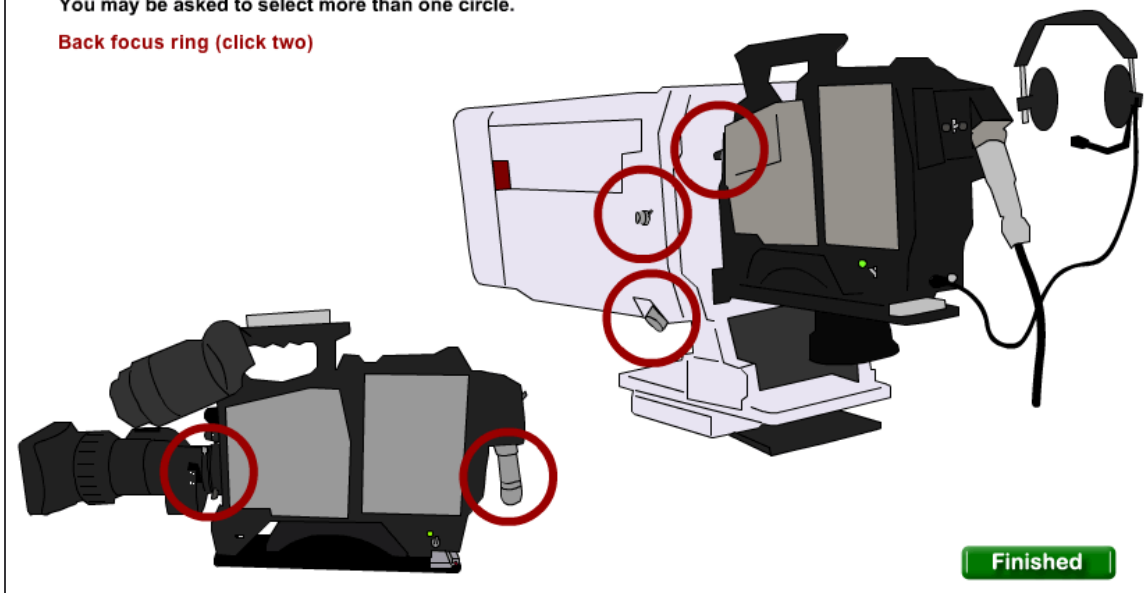
Plate lock (click two)
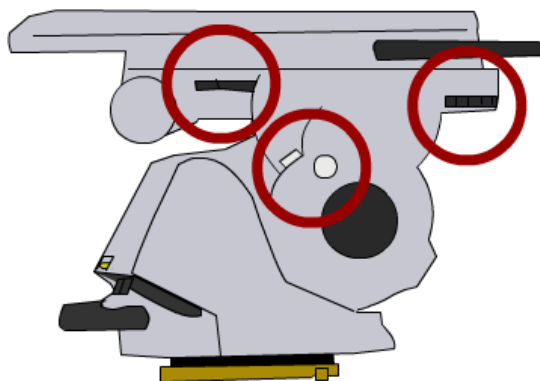
Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.
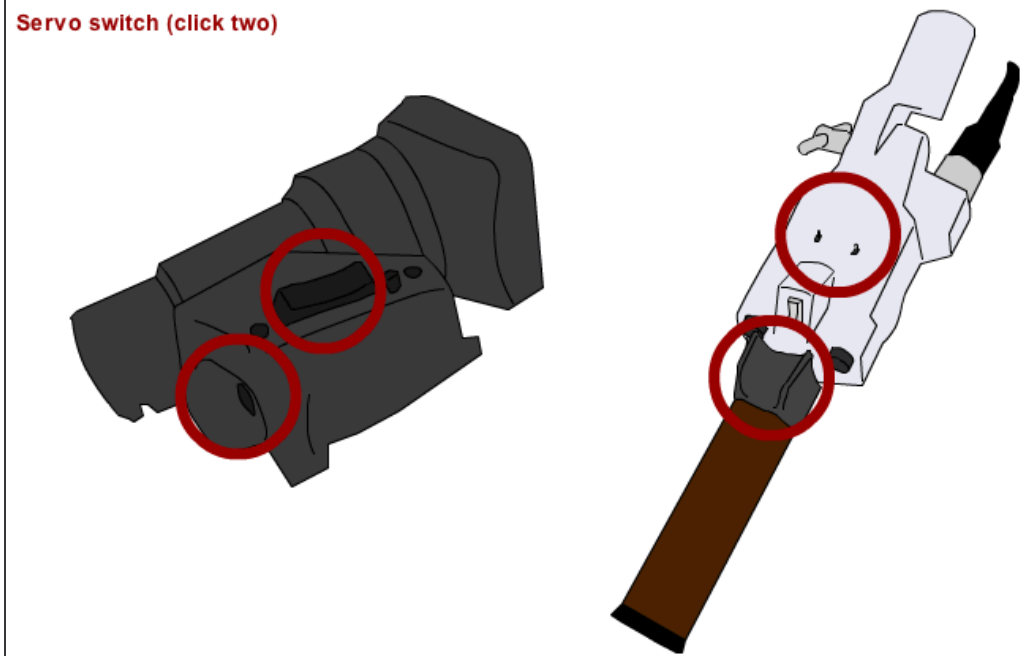
Bubbles (click two)

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.
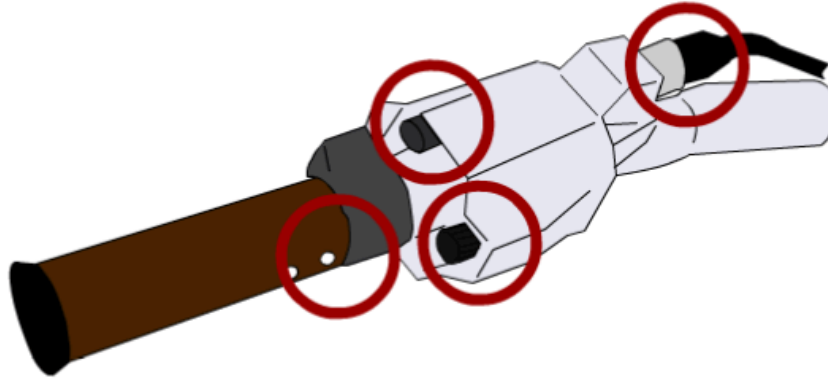
Back focus ring (click two)

Finished

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.
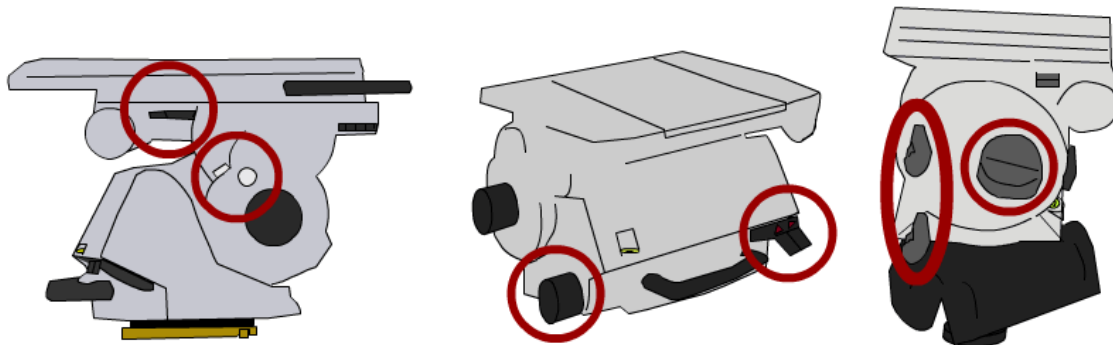
Servo switch (click two)

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.

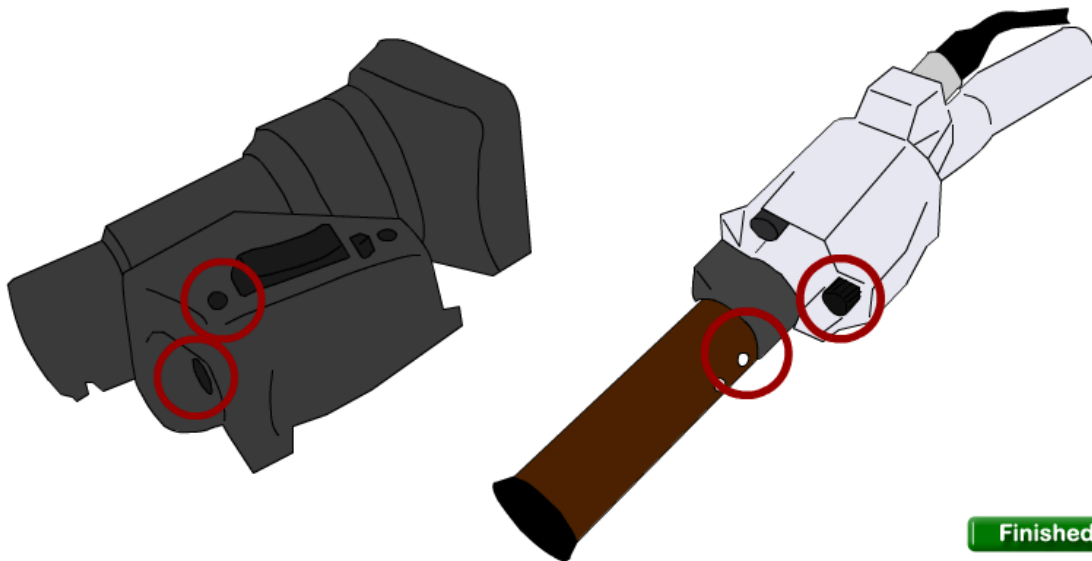**Zoom speed control (click one)**

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.
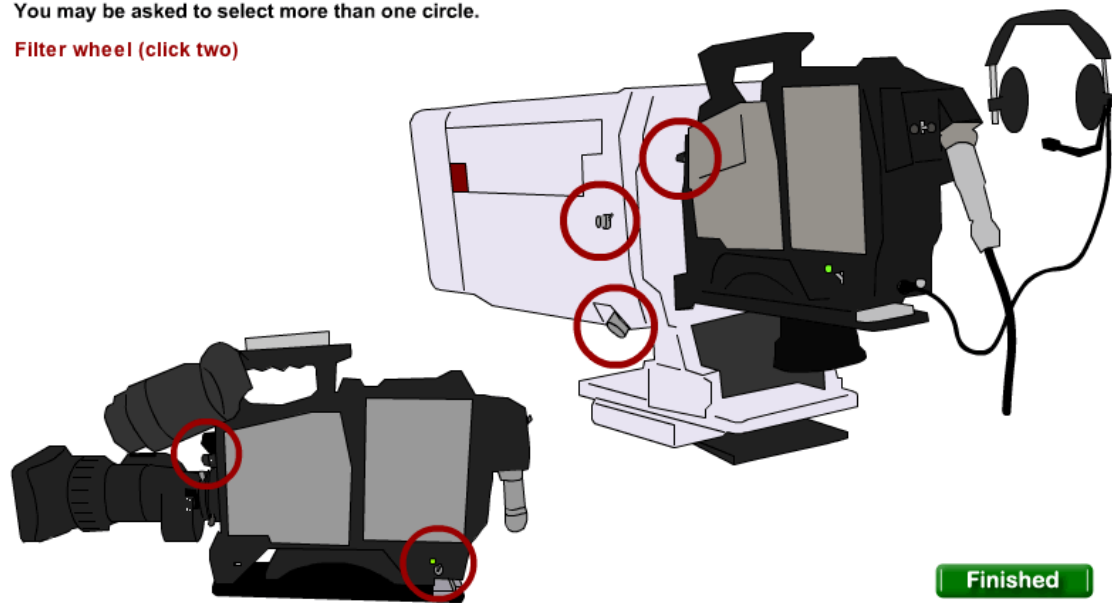
Pan and Tilt Locks (click three)

Select the circle around the part listed below. The circle will turn yellow when selected.
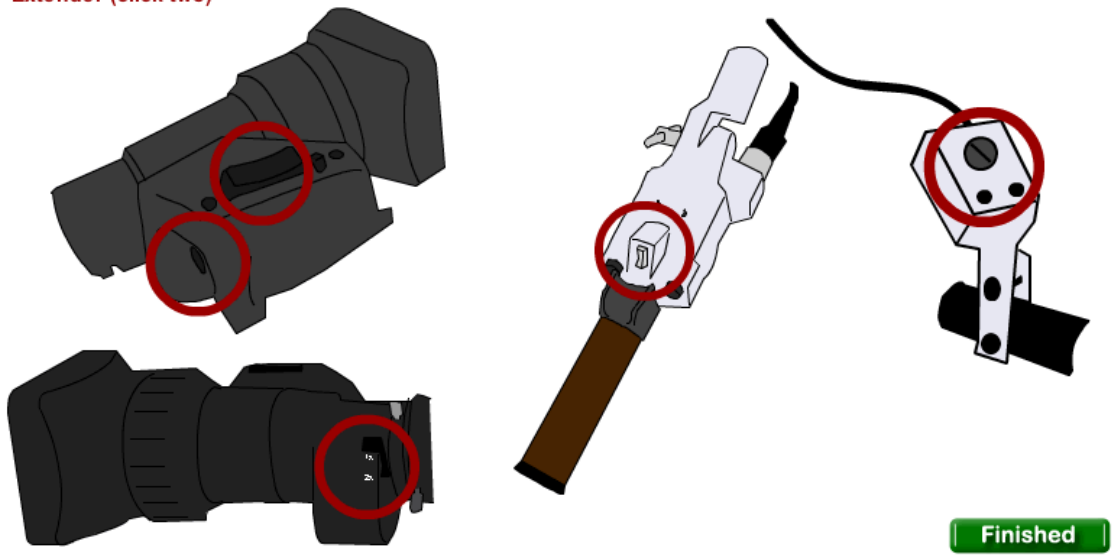You may be asked to select more than one circle.

Return button (click two)

Finished

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.

Filter wheel (click two)

Finished

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.

Extender (click two)

Finished

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.

Head Lock (For leveling head - click one)

Select the circle around the part listed below. The circle will turn yellow when selected.
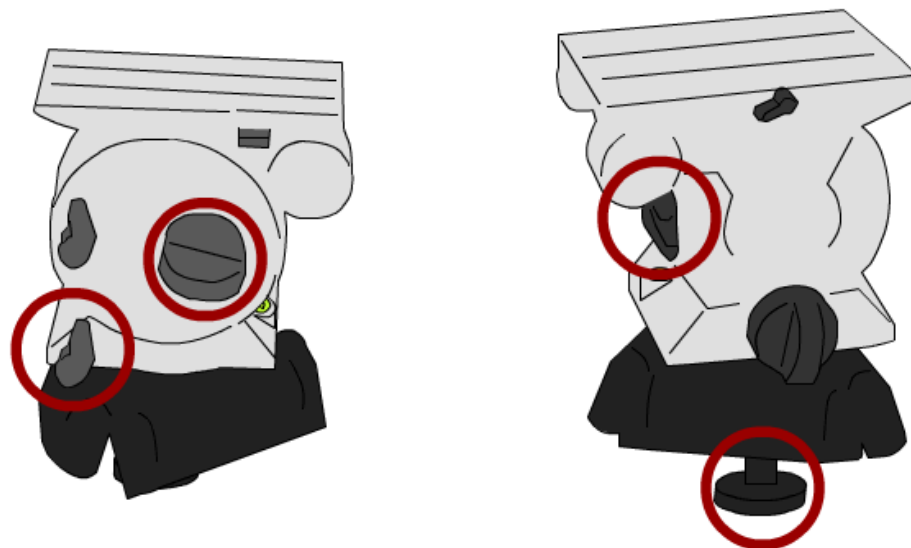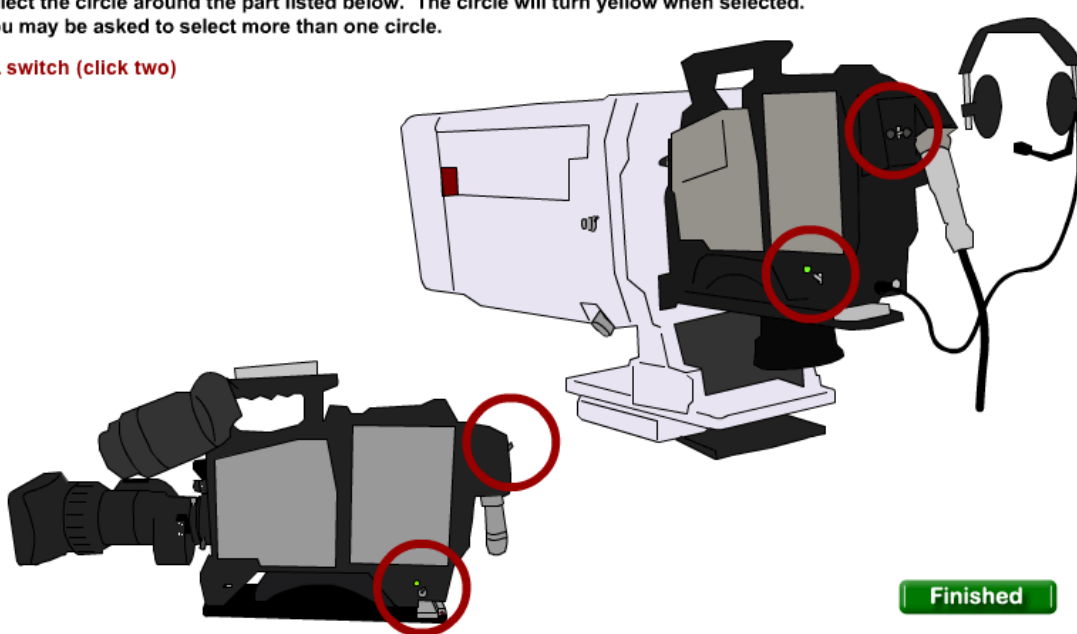You may be asked to select more than one circle.

PL switch (click two)

Finished

Select the circle around the part listed below. The circle will turn yellow when selected.
You may be asked to select more than one circle.

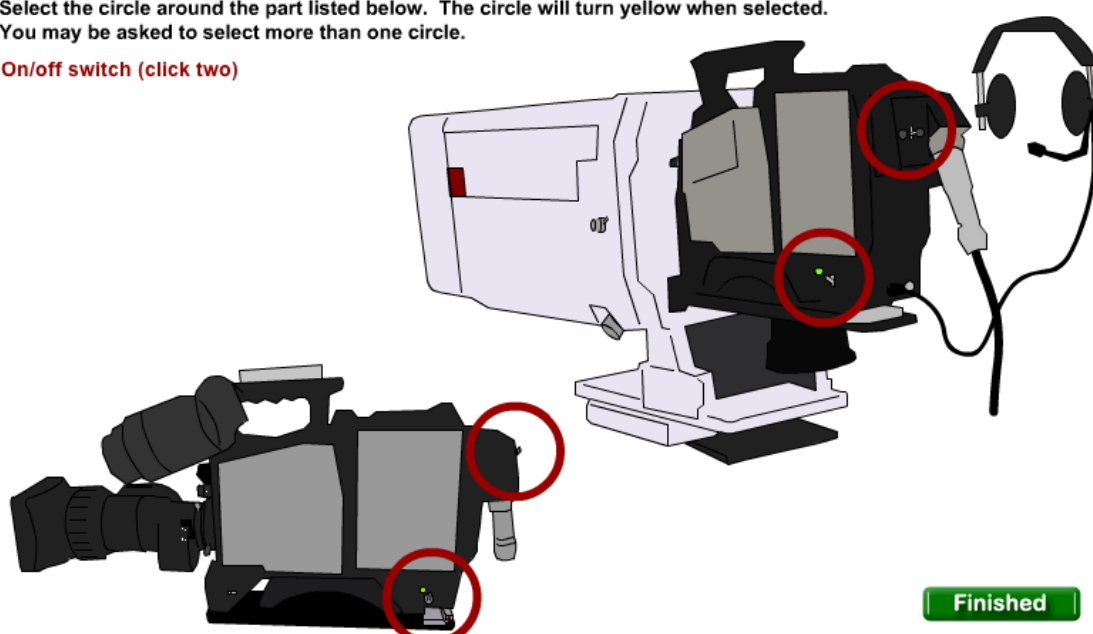**On/off switch (click two)**

Finished

Appendix C

Questionnaire Questions

1. Please complete the following

Male
Female
Age:

2. How much experience do you have working a video camera (consumer or professional model)?

Extensive experience - I shoot professionally or work on a crew
Frequent experience - I use a video camera often
Moderate experience - I use a video camera occasionally
Little experience - I use a video camera rarely
Never used a video camera

3. Overall, how would you rate the effectiveness of this tutorial?

Very effective
Fairly effective
Average in its effectiveness
Somewhat ineffective
Very ineffective

Please explain any weaknesses in the tutorial:

4. This tutorial is designed to train new camera operators who have no opportunities for hands-on training before their first day. Assuming no hands-on training is available, would you recommend a different method to train camera operators? (e.g. a printed manual, a video, etc.)

Yes
No
Maybe

Please explain:

5. How do you feel about the amount of information in the tutorial?

Had far too much information
Had somewhat too much information
Had the right amount of information
Had somewhat too little information
Had far too little information

Please explain:

6. How logical was the organization and sequence of units and sections?

Very logical
Fairly logical
Average in its logic
Somewhat illogical
Very illogical

Please explain:

7. How clear was the navigation to understand and follow?

Very clear
Fairly clear
Average in its clarity
Somewhat unclear
Very unclear

Please explain:

8. Do you believe that similar tutorials about other topics in television production would be appropriate?

Yes
No
Maybe

Please explain:

9. Any other comments, questions, concerns?

Appendix D

Pretest / Posttest Scores

Participant Number	Gender	Age	Previous Experience	Pretest	Posttest
1	M	22	Moderate	11	24
2	F	20	None	7	27
3	M	34	Moderate	8	24
4	M	44	Moderate	15	29
5	M	23	Moderate	17	25
6	M	25	Little	8	18
7	F	19	Little	10	23
8	F	19	Moderate	13	25
9	F	21	None	7	18
10	M	22	Frequent	12	24
11	M	23	Little	8	20

Appendix E

Questionnaire Responses

Question	Responses	Number	Written Feedback
2. How much experience do you have working a video camera (consumer or professional model)?	Extensive experience - I shoot professionally or work on a crew	0	
	Frequent experience - I use a video camera often	1	
	Moderate experience - I use a video camera occasionally	5	
	Little experience - I use a video camera rarely	3	
	Never used a video camera	2	
3. Overall, how would you rate the effectiveness of this tutorial?	Very effective	7	Some of the illustrations are not so clear. The parts of the camera weren't easy to learn this way.
	Fairly effective	4	
	Average in its effectiveness	0	Sometimes it was hard to see the black buttons on the dark gray camera
	Somewhat ineffective	0	It shows examples of only one hard and one hand-held camera. Though you cannot show all models, some example of others may be helpful.
	Very ineffective	0	
			A little long, but I was taking it merely as a test. It is fairly thorough.
			It's nothing you did wrong... it's just boring to learn about switches and that kind of thing! But I thought that your graphics were really helpful!!
			Lots of info, pictures not that great

Question	Responses	Number	Written Feedback
4. This tutorial is designed to train new camera operators who have no opportunities for hands-on training before their first day. Assuming no hands-on training is available, would you recommend a different method to train camera operators? (e.g. a printed manual, a video, etc.)	Yes	0	This along with a brief video demonstrating what this tutorial is teaching.
	No	9	
	Maybe	2	This way seemed great to me.
			I think this is very effective
			This is pretty good. Supervision once they are on is of course preferred, but this seems to do a good job. Possibly having printed material for them to review later is good.
			Yes I would recommend a little of all. People learn things in different ways and should have all at their disposal.
			This was really good! the graphics were fantastic and if I needed to know anything about camera switches, etc, I would for sure review this again with a little more care.
			The best experience is actually working with the camera
5. How do you feel about the amount of information in the tutorial?	Had far too much information	0	Just took a long time
	Had somewhat too much information	5	It has a lot of information and stalled on me. Something's don't need to be explained so in-depth. They're pretty easy to understand especially for a guy like me with relatively no experience.
	Had the right amount of information	6	
	Had somewhat too little information	0	It was great!
	Had far too little information	0	
6. How logical was the organization and sequence of units and sections?	Very logical	6	The different sections of information allowed me to progress and learn with each section.
	Fairly logical	5	
	Average in its logic	0	good!
	Somewhat illogical	0	
	Very illogical	0	

Question	Responses	Number	Written Feedback
7. How clear was the navigation to understand and follow?	Very clear	8	The tutorial had trouble going on to the next phase. From this, it was not clear how to get it going again.
	Fairly clear	3	
	Average in its clarity	0	
	Somewhat unclear	0	
	Very unclear	0	
8. Do you believe that similar tutorials about other topics in television production would be appropriate?	Yes	8	It was helpful and improved my score
	No	0	
	Maybe	3	They could be used but shouldn't be the only thing used to teach.
			Some things need to be learned hands on but some things can be learned in a tutorial like this
9. Any other comments, questions, concerns?			In 1) Framing #24 the text ends prematurely
			The only thing I struggled on was the rule of thirds. I think the program was a little too picky on what it deemed to be a correct answer, even if it was close. Otherwise a good tutorial.