The teaching of digital vs. traditional photography

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The teaching of digital vs. traditional photography

Abstract
I have been teaching photography in the traditional sense for over fifteen years. I have seen photography shift in those years from a silver-based medium to encompass the digital world, a filmless kind of art. The two media are very different, and the teaching of them are correspondingly different, yet the end result should be the same: a student who can produce an image that is visually satisfying, whether the image is informative in nature or is considered fine art. In this project, I want to compare instructional strategies for traditional photography tools to teaching strategies for digital photography.
The Teaching of Digital vs. Traditional Photography

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I have been teaching photography in the traditional sense for over fifteen years. I have seen photography shift in those years from a silver-based medium to encompass the digital world, a filmless kind of art. The two media are very different, and the teaching of them are correspondingly different, yet the end result should be the same: a student who can produce an image that is visually satisfying, whether the image is informative in nature or is considered fine art. In this project, I want to compare instructional strategies for traditional photography tools to teaching strategies for digital photography. Traditional photography requires photographic film and paper, a darkroom, enlargers, running water and chemistry. There are many books on traditional photography that tell how to use these things, but this project will tell how they are used at The Hearst Center for the Arts in Cedar Falls, Iowa. There is currently very little literature available on the teaching of digital photography, and this project will attempt to partially fill that void. Digital photography requires computers, digital input devices such as cameras and scanners, and software. This project will use the computers, input devices and software in the Educational Technology department at the University of Northern Iowa as examples for instruction.

All traditional photographic processes are based on the same principle: that certain silver salt compounds are light sensitive. Traditional photography uses film and paper coated with these salts, light, and developing and fixative
chemistry to produce images. Photography that is digital can only work with information that is in concrete, finite, countable chunks (Williams & Tollet, 1998, p.17). Digital photography uses filmless cameras or scanners that convert digital information to images using computer technology.

Photography has been around in arts and technology departments for many years. It serves several different functions. One is as an objective recorder. This is known as "straight" photography. Straight photography traditionally has been used to illustrate textbooks; to depict history as in Matthew Brady's civil war photos; to realistically portray products in catalogs, and otherwise give a truthful depiction of objects, people and events. Another function is as art. In this respect, more manipulation is allowed: retouching, be it digital or darkroom. Photography as art can be as simple as an alert artist taking a straight photograph of a scenic landscape or as complex as a collage of many manipulated images. The teaching of straight and art photography will endure even as some methods of instruction will change, and that is what this project will illustrate.
Literature Review

This review of literature compares and contrasts traditional and digital photography instruction so that we can begin to understand the basis of this project.

The teaching of traditional black and white photography is many times based on the zone system by Ansel Adams. To exploit the zone system, the photographer must become sufficiently sensitive in his awareness of the photographic medium to enable him to analyze a subject in terms of its tonal range and how this range can first be recorded on film and then printed as a positive image on paper. To help in this analysis, Adams codified light intensity into a gray scale composed of ten zones that rank tonal values from black, which has 0 light, to 9 for white, which is intensity of of total saturation. Once printed, zone 9 leaves the paper white, while zone 0 yields pure black. (Swedlund, 1974, p. 257)

Herein lies one fundamental difference in teaching traditional and digital photography. Traditional photography is based upon a hard copy only method of viewing the photograph, while an image taken with a digital camera is more likely to be viewed with a light source behind it, i.e.: on a computer screen. It is less likely for a digital image to be printed as a hard copy because traditional photography, at this point in time, still gives a sharper image in a hard copy than an image generated from a digital camera. However, an advantage to photography from digital cameras is that it
lends itself to the convenience of instant viewing. "If you don’t want the continual expense of buying film and having it processed, and you are prepared to view your pictures via the television set, then the new generation of digital still-video cameras...might be worth considering" (Hedgecoe, 1996, p.16). We see that there are advantages and disadvantages to both kinds of photography.

Cavanaugh and Cavanaugh (1997) listed advantages and disadvantages for digital still cameras compared to film cameras. Their list of advantages included:

1. Higher turnaround speed for production of usable images.
2. Instant availability of images for output to print, videotape or image file.
3. Digital images can be printed or used in presentations such as HyperStudio or PowerPoint.
4. Prints and computer files are easy to duplicate and can be copied indefinitely at low costs from a digital photograph.
5. Major savings are realized as no film is used and no developing is needed.
6. Image appearance and quality can be easily controlled and adjusted using software included with cameras.
7. No special hardware other than standard computers and printers are needed to create photographic images.

Cavanaugh and Cavanaugh also cited disadvantages of digital cameras in education:

1. Digital image quality is usually lower compared to prints and slides.
2. Standard photograph-quality digital cameras cost much more than their film-based counterparts.

The disadvantages cited by Cavanaugh and Cavanaugh (1997) are changing as digital technology improves. Each new generation of digital cameras produces images that are sharper than the generation before. As with any technology, the longer it is around the more prices drop.

Lantz (1996) was very positive about digital imaging in education. Lantz concluded that the transformation of photo education by digital photography is evident because undergraduate and graduate programs in electronic imaging have been introduced and virtually all undergraduate instruction in photography has a digital imaging component or core course. He supported Cavanaugh and Cavanaugh (1997) in their listing of advantages of digital photography.

However, the transition may not be seamless. Brown (1997) pointed to history in the art department she studied to illustrate the fear of new technology. Eventually, of course, enough people were trained in the technology of digital imaging. Brown constantly alluded to the phenomenon of improvisation that educators versed in both traditional and digital photography used while teaching. She likened expertise to a moving target where teachers aim with whatever tools they have at hand (Brown, 1997, p.26).

Brown (1997) also wrote that the first attempts of the undergraduate, graduate and faculty artists to incorporate digital imaging into their curriculum and practices were in response to pressures and inquiries about the new technologies within and outside the program, the department
and the university. Brown again brought up the concept of improvisation in her portrayal of the program members reaching to a much higher level with digital imaging than when they were working in film based work.
The Teaching of Traditional Photography at The Hearst Center

The Hearst Center is a city-run, non-profit art center. Students are solicited by newspaper announcement, flyer, and city public announcements. The learners in this class are from the Waterloo/ Cedar Falls metro population. The minimum age for the class is 14. The class is a non-credit program meant for pure learning enjoyment of the students. Each session is two hours, and the class meets once a week for eight weeks. The first two hour session of the class is taught in one of the regular classrooms using photocopied handouts (Appendices D, E, F and G) and the students' own cameras as learning tools. The cost per student is about sixty-five dollars. The Hearst Center provides everything the student needs except film. At the Hearst Center, there is an outer light room consisting of a sink with film processing capacities, equipment and chemicals, paper drying racks, and a film drying closet. Inside there is a darkroom with four enlarging stations. Each station consists of an enlarger hooked up to a timer. There is a wet area, or sink for the three trays of chemicals: developer, stop bath and fixer. This is all provided by the Hearst Center as is enlarging paper.

The key elements of traditional photography at the Hearst Center are developing a black and white negative, using light to enlarge it onto sensitized paper, and processing both film and paper in chemistry.

The goal of the traditional photography class at the Hearst Center is to require a student to both compose and
print a good photograph. When the class is over, the student can always use Hearst Center facilities to:

1. Compose a good photograph;
2. Develop a roll of black and white film;
3. Print a black and white enlargement with a range of gray tones from black to white.

In my role as instructor at the Hearst Center, I developed some of the curriculum in response to questions raised by learners. Some of these questions were generated by learning camera functions, such as f-stops and shutter speeds. Other portions of the curriculum, such as developing film or developing prints, can be gleaned from the instructions from film, chemicals, and photographic paper. The lesson materials in Appendices A, C, D, E, F, and G may be used for the instruction of a traditional photography class. They include instruction on composition, camera functions, developing black and white film, making a contact print, making a test print, and making an enlargement.
The Teaching of Digital Photography Using Tools at the University of Northern Iowa

Digital photography needs to be taught, as there is a growing number of applications for it. Internet applications are already used in undergraduate course work, as is electronic mail. Digital photography is a way of adding to already existing means of electronic communication. It is a means of saving time as there is no developing of film. Another way that digital photography saves time is that images can be immediately viewed, thus cutting down on re-shoots. Digital photography saves space as the room for production can be used for other purposes, unlike a darkroom.

In the department of Curriculum and Instruction, Division of Educational Technology at the University of Northern Iowa, there are several rooms where digital photography is in use. One room is 405 Schindler Education Center (SEC). This room contains computers with the software needed to manipulate digital images (Adobe Photoshop, Photo Deluxe) and scanners to input analog images into digital format. The Methods Lab, SEC 127, contains the software and computer (Apple G3) to manipulate images from the Kodak DC220 camera, which is also contained in SEC 127.

The students who would take this digital photography course are graduate and undergraduate students in UNI's Educational Technology program, in which Photography is an elective. There would be 45 contact hours for the three credits.

The key elements of digital photography for this course are digital cameras such as the Kodak DC220 and Sony Mavica
MVC-FD 71, scanners (Umax), computers (Macintosh), and digital manipulation software (Adobe Photoshop, Adobe PhotoDeluxe).

The goal of the digital photography class is to require a student to compose and electronically input a good digital photo. After completing the digital photography course, students in digital photography in the department of Curriculum and Instruction, Division of Educational Technology at the University of Northern Iowa will be able to:

1. Use controls on Kodak DC220 and Sony Mavica MVC-FD71 cameras to compose and take a digital image
2. Input digital images from Kodak DC220 camera into Macintosh G3 computer using Adobe Photodeluxe software
3. Input digital images from Sony Mavica MVC-FD 71 into Macintosh computer using 3.5 inch floppy disk
4. Use a Umax scanner to input an existing traditional photograph into a Macintosh computer
5. Use Adobe Photoshop software to manipulate digital images

Appendices B, D, E, F, G, H and I in this project can be used to instruct a digital photography class so that these objectives are obtained. Included in this instruction is how to take a digital image, how to input the image into a computer, how to scan a traditional photo, and how to use software to manipulate a digital image.
Discussion

There are some aspects of both traditional and digital photography that can be taught in the same way. Composition, for instance, would be the same for both. The rule of thirds is a compositional aid that uses two imaginary vertical lines cutting an image into thirds as well as two horizontal lines. The intersections suggest four eye pleasing spots for the center of interest (Appendix G). The rule of thirds looks the same through any viewfinder, as do framing and leading lines. Framing is using natural formations such as tree branches to emphasize a subject. Leading lines lead the eye to a subject. The idea of cropping in the viewfinder (excluding superfluous objects from the image) stays the same for both digital and traditional photography. Lighting techniques would also stay the same for both disciplines. Daylight or tungsten lighting mean the same effects in both digital and traditional photography—no filtration for daylight, blue filtration for tungsten lighting. Flash techniques also translate well between the two. Zoom lenses zoom between wide angle and telephoto both in digital and traditional photography. The skills for this knowledge would be taught in the same manner for both disciplines.

The difference is in the manipulation of images, i.e. darkroom vs. software. Digital photography's darkroom is Adobe Photoshop, Photo Deluxe, etc. Whereas traditional photography uses a tiny brush and paint to remove dust spots, the Adobe Photoshop program can zoom in to retouch pixel by pixel. Photoshop also has the ability to add type to an
image, use layers to add effects, and turn a photograph into a drawing or painting, amongst the thousands of other possibilities. The wonderful thing about computer software as opposed to traditional darkrooms is that if you make a mistake, you can immediately correct it. Some disadvantages of traditional photography are that it needs a darkroom, adequate ventilation to be protected from chemical fumes, running water, an enlarger for each student, and constant inventory of chemicals. There are also disadvantages to digital photography. One drawback to teaching digital photography is that each student needs access to a computer and software; however the space needed for digital photography can be less than traditional as computers can be used for other purposes (no darkroom). Scanners are somewhat of a hybrid of traditional and digital photography in that a traditional photo can be placed in a scanner and a relatively high-resolution (sharp) image can be obtained.

Conclusion

The costs involved for both traditional and digital photography instruction can be high. Digital cameras generally cost more for the same basic features found in traditional cameras; however, costs for digital cameras are already starting to come down. Enlargers for traditional photographs run from several hundred to thousands of dollars; this is comparable to the costs of computers. Costs for tanks, reels, trays, beakers, chemicals and thermometers can be compared to costs for scanners and software.
There is a place in education for both traditional and
digital photography. I believe that in the future, however,
traditional darkroom procedures will be taught as an art
instead of a way of recording "straight" images. I have
already observed this phenomenon in some of the Hearst
students who attend a local high school. Their school
darkroom lies unused, and the Hearst Center class is their
only way of accessing knowledge of traditional photography.
Their yearbook is assembled in a distant state from snapshots
and text they send to a production company. Therefore, their
learning of traditional photography is only a means of
learning an art that is beginning to be obsolete. In time,
digital photography will all but replace traditional
"straight" photography as resolution of images becomes finer
and the convenience of digital photography outweighs the
costs.
References


Appendix A

Syllabus For Hearst Center Class

Week 1 Using the Camera and Taking Pictures
A. Cleaning the camera
B. Loading the camera
C. Holding the camera
D. Viewfinders
E. Exposure controls
F. Film
G. Flash
H. Lenses
I. Composition
J. Lighting

Week 2 Developing Film

Week 3 Making Contact Sheets
A. Exposing
B. Processing

Week 4 Making Test Prints
A. Exposing
B. Processing

Week 5 Making Enlargements
A. Exposing
B. Processing

Week 6 Work on learned skills
Week 7 Work on learned skills
Week 8 Work on learned skills

The goal of the traditional photography class at the Hearst Center is to require a student to both compose and
print a good photograph. When the class is over, the student can always use Hearst Center facilities to:

1. Compose a good photograph;
2. Develop a roll of black and white film;
3. Make a contact sheet;
4. Make a test print;
5. Make an enlargement.

Instruction of Traditional Photography

Week One:

During the lecture in the first week of class, the students are told not to force any movement of the camera. There is a demonstration of how to clean the lens:

1. Blow on the lens or use a device such as canned air to remove particles.
2. Use a cloth or tissue specially made for lenses to remove fingerprints.

The students are shown how to load film into the camera, making sure that they shield it from bright light. There is a demonstration of how to affirm that the film is moving once the camera is loaded. This lesson varies from camera to camera. There is a lesson on how to hold your body when taking a photo:

1. Tuck your arms into your body.
2. Spread your legs wide to maximize steadiness.
3. Hold your breath as you push the shutter release with a smooth motion.

The next step in the first session is a discussion of the difference in viewfinders between a single lens reflex
camera and a rangefinder camera. You can see directly through the lens (with a mirror) in a single lens reflex camera so that what you see is what you get. (Appendix C) In a rangefinder camera, there is a potential parallax problem in that the photographer looks through a window that is separate from the picture-taking lens.

Another thing that is discussed in this first session is exposure controls in a traditional camera; f-stops, shutter speeds, and film speed. Another word for f-stop is aperture, or lens opening. An f-stop is the size of the opening that admits light in a lens (Appendix D). The actual meaning of the number of the f-stop is derived from the lens’ focal length divided by effective diameter of the lens. The shutter speed is the time value of how long the shutter stays open to admit light into the camera. Film speed numbers tell us how sensitive the film is to light: The higher the number, the more sensitive the film is to light. Along with this discussion comes the side effects of these three controls; depth of field, stopping or depiction of motion, and the graininess of high speed film. The definition of depth of field is: The zone extending in front of and behind the point of sharpest focus throughout which focus seems acceptably sharp and unblurred (Appendix E). Stopping of motion is depicted in Appendix F. Graininess in a film refers to particles and clumps of black metallic silver that form a developed photographic image and become visible under magnification or in an enlargement.

Continuing the discussion of film, many different types of film are available for traditional photography. There is
color negative film (primarily for making prints); chrome or transparency film which was developed to have a light source behind it; and black and white (panchromatic) film. A short lesson on caring for film is given: Protect it from heat and X-rays.

Then comes the flash instruction. In traditional photography, flash is best utilized when it is a separate unit from the camera itself. Flash can be used in situations with backlighting to compensate for underexposed subjects. Bounce flash can be used to eliminate harsh shadows and red-eye. Bounce flash refers to a camera with a flexible head which can be shot at an angle so as to bounce the light from a white ceiling or a white card attached to the flash. Flash eats batteries, so extra batteries should be kept on hand.

Next in this session, I teach about the different lenses that are used in traditional photography. Lenses are described in terms of focal length. The actual definition of focal length is the distance from the lens to the plane where the subject has been focused upon. Generally speaking, wide angle lenses are those whose focal lengths are less than 50 mm, and telephoto lenses are those over 50 mm. There are wide angle lenses for scenic or group shots, normal lenses (about 50 mm, or what the human eye sees) and telephoto lenses for portraits and to bring things in closer. Zoom lenses can be a combination of all lenses.

Composition is a staple in teaching traditional photography. The rule of thirds is demonstrated (Appendix G). I show photographs that portray how different angles give the image different moods. I teach the students to crop in the
viewfinder, not the darkroom. Lines (roads, railroad tracks, etc.) can lead the viewer's eye to the subject. Tree branches, doorways, windows etc. can be used as natural frames around subjects.

Lighting is the next subject in the lesson. Inside, with no flash, (available lighting) filters may have to be used corresponding to what type of lighting is used. A magenta filter is needed with fluorescent lighting, a blue filter with tungsten bulbs.

Week Two:

Week two's lesson is about darkroom procedures. The first step in obtaining an image is to develop the film. I teach how to develop black and white images, but the procedure is fundamentally the same for color images as well. Following is the instruction I use for developing film, in the second class session.

Developing Film

· Gather together: Your film, bottle opener, scissors, tank, and enough reels to fill tank. Take into darkroom.
· Keep your equipment on top of one of the counters, to keep from dropping on floor. (It's hard to find in total darkness.)
· Turn out ALL lights, including safelights.
· Open flat end of film can with bottle opener.
· Pull film out of can. Cut leader off. Cut film off spool.
· Using large triangular tabs as starting point, thread film onto reel.
· When you get film on reel, put on spindle in tank and
push all the way to the bottom.
- Tank must be filled to capacity with reels, even if reels are empty.
- Put light-tight lid on tank and take into film developing area.
- Each FULL reel needs 10 oz. of chemical.
- Check under sink for already mixed fixer. If there isn’t any, mix with concentrate according to dilution table on bottle.
- If using already mixed fixer, check for exhaustion with Hypo-Check.
- Measure fixer into graduate so that it’s ready to go when you need it.
- See bottle of developer for temperature, dilution ratio, agitation instructions, and development time.
- Leave light-tight lid on. Pour developer in.
- Add water-tight lid.
- Agitate 5 seconds every 30 seconds.
- After development time is up, remove water-tight lid and dump out developer.
- Leave light-tight lid on.
- Rinse film for 30 seconds.
- Pour in fixer. Fix ten minutes for T-max, five for other.
- Agitate once per minute.
- SAVE FIXER. Pour back in bottle. Film can now be exposed to light.
- Rinse film for 30 seconds.
- Mix up Hypo-Clear according to directions on bottle.
Agitate continuously for 30 seconds.

- Put film in film washer.
- Wash film for 5 minutes.
- Empty water, put 1 capful OR LESS of Photo-Flo into tank and add water until it foams
- Squeegee film. (You can rinse your fingers off and use them).
- Hang to dry in drying closet.

To get proper exposure when developing film, care must be taken to have the developer at the exact temperature needed, as well as attention to length of time developed. This makes having a thermometer and a timer imperative.

The film must be dried in an airtight place so as to insure dust-free negatives.

Week Three:

In the third week the students are taught how to make a contact sheet. A contact sheet in traditional photography is an 8x10 inch sheet of photographic paper with an entire roll of film laid on it (contacting the paper) and a piece of glass laid on top of the film. The sheet of paper is exposed to light, developed and fixed so that all the images on a roll of film can be viewed at once. Then the contact sheet is processed:

- Use tongs. Don’t switch the tongs from one chemical to another as this will contaminate the chemistry.
- Use the tongs to flip paper over.
- Using a rocking motion, agitate the paper continuously.
- Develop between 45 and 90 seconds (MINIMUM 45 seconds).
- When full development is reached, remove print from
developer with tongs.
• Place print in stop bath and agitate for 30 seconds.
• Remove print from stop bath.
• Place print in fixer.
• Leave print in fixer for two minutes.
• Get a tray and put print in it.
• Take print outside darkroom if you want to look at it.
• Wash print for 5 minutes. If someone has already started
  a wash bath, don’t add yours! You will contaminate the
  wash.
• Take print out of print washer and squeegee it.
• Place print(s) on screen racks to dry.

Week Four:

Following are the instructions for the fourth week:

Making a black and white test print:
• Place negative strip in negative carrier.
• Set enlarging lens to f5.6
• Turn out white lights. (You can have safelights on).
• Turn on enlarger to “F” (for focus) via toggle switch on
  timer.
• Place enlarging easel under enlarging lens.
• Raise or lower enlarger head until image fills easel.
• Turn focusing knob on enlarger until projected image is
  focused.
• Make sure image still fills easel.
• Turn enlarger to “T” (for timer) via toggle switch on
  timer.
• Set timer to twelve seconds.
• Get photographic paper from light-tight box.
· Place paper in easel shiny side up.
· Depress timer switch while holding a piece of cardboard across the paper with one fourth of the paper showing.
· Move the cardboard four times in three second intervals while timer counts down twelve seconds.
· Process paper in chemistry.
· Choose which strip is best exposed. If none of the four strips is correctly exposed, open or close the lens one f-stop and repeat test print process.

The next step describes processing the paper for the test print.

· Use tongs. Don't switch the tongs from one chemical to another as this will contaminate the chemistry.
· Place paper shiny side down in developer tray.
· Use the tongs to flip paper over.
· Using a rocking motion, agitate the paper continuously.
· Develop between 45 and 90 seconds (MINIMUM 45 seconds).
· When full development is reached, remove print from developer with tongs.
· Place print in stop bath and agitate for 30 seconds.
· Remove print from stop bath.
· Place print in fixer.
· Leave print in fixer for two minutes.
· Get a tray and put print in it.
· Take print outside darkroom if you want to look at it.
· Wash print for 5 minutes. If someone has already started a wash bath, don't add yours! You will contaminate the wash.
Week Five:

Week fives' lesson is making an enlargement. Enlarging the negatives onto photographic paper is the next step in learning about traditional photography. A totally dark room is needed. An enlarger costing up to thousands of dollars is needed. Developer, stop bath and fixer and hypo-check are the necessary chemicals. Tongs to keep from touching the hazardous chemicals are needed. A print washer is necessary. If you want to see what you are doing, you need a safe light. Other items that aren't absolutely necessary but make enlarging a much more enjoyable experience: dust remover (to keep from enlarging dust particles along with your image), grain focusser (magnifies your image making it easier to focus), enlarging easel, (to hold photographic paper flat) timer that automatically turns enlarger on and off (otherwise you count one hippopotamus, two hippopotamus) another timer or glow-in-the-dark clock for timing length of paper in chemicals, and a squeegee to keep water from spotting the prints. Here is the instruction for week five:

· Place negative strip in negative carrier.
· Set enlarging lens to f5.6
· Turn out white lights. (You can have safelights on).
· Turn on enlarger to "F" (for focus) via toggle switch on timer.
· Place enlarging easel under enlarging lens.
· Raise or lower enlarger head until image fills easel.
· Turn focusing knob on enlarger until projected image is
focused.

· Make sure image still fills easel.

· Turn enlarger to "T" (for timer) via toggle switch on timer.

· Set timer to time determined by making test print.

· Get photographic paper from light-tight box.

· Place paper in easel shiny side up.

· Depress timer switch to make enlargement.

The next step in enlarging is to process the paper in chemistry:

· Use tongs. Don’t switch the tongs from one chemical to another as this will contaminate the chemistry.

· Place paper shiny side down in developer tray.

· Use the tongs to flip paper over.

· Using a rocking motion, agitate the paper continuously.

· Develop between 45 and 90 seconds (MINIMUM 45 seconds).

· When full development is reached, remove print from developer with tongs.

· Place print in stop bath and agitate for 30 seconds.

· Remove print from stop bath.

· Place print in fixer.

· Leave print in fixer for two minutes.

· Get a tray and put print in it.

· Take print outside darkroom if you want to look at it.

· Wash print for 5 minutes. If someone has already started a wash bath, don’t add yours! You will contaminate the wash.

· Take print out of print washer and squeegee it.

· Place print(s) on screen racks to dry.
In weeks six, seven and eight, the students are allowed to work in the darkroom making contact sheets, test strips and enlargements with the instructor's supervision.
Appendix B

Syllabus For Teaching Digital Photography at UNI

Session 1 General Digital Photography
A. Removable Memory
B. Viewfinders
C. Exposure Controls
D. Resolution
E. Lenses
F. Composition
G. Lighting

Session 2 Digital Cameras in Curriculum and Instruction, Educational Technology Department, University of Northern Iowa
A. Kodak DC220
   1. Taking pictures and camera functions
   2. Inputting photos to computer
B. Sony Mavica MVC-FD71
   1. Taking pictures and camera functions
   2. Inputting photos to computer

Session 3 Scanning Images
A. Using Umax Scanners
B. Using Adobe Photoshop

Session 4 Students take turns using cameras, scanners, and Adobe Photoshop

Session 5 Students take turns using cameras, scanners, and Adobe Photoshop

Session 6 Students take turns using cameras, scanners, and Adobe Photoshop
Session 7 Students take turns using cameras, scanners, and Adobe Photoshop

Session 8 Students take turns using cameras, scanners, and Adobe Photoshop

The goal of the digital photography class is to require a student to compose and electronically input a good digital photo. After completing the digital photography course, students in digital photography in the department of Curriculum and Instruction, Division of Educational Technology at the University of Northern Iowa will be able to:

1. Use controls on Kodak DC220 and Sony Mavica MVC-FD 71 to compose and take a digital image
2. Input digital images from Kodak DC220 camera into Macintosh G3 computer using Adobe Photodeluxe software
3. Input digital images from Sony Mavica MVC-FD 71 into Macintosh computer using 3.5 inch floppy disk
4. Use a Umax scanner and Adobe Photoshop to input an existing traditional photograph into a Macintosh computer
5. Use Adobe Photoshop software to manipulate digital images

Instruction of Digital Photography

Session One:

In session 1, the instruction should be about general digital photography. The first and biggest difference between a digital and a traditional camera is that there is no film,
therefore there are no restrictions on the conditions of loading the film. There is never a problem forgetting to load film. Instead of film, most digital cameras have some sort of removable memory, ranging from a flash card to a floppy disk that can be transferred to a computer. There are adapters that will take some sorts of removable memory. Some fit into a USB cord connection, others are floppy disk size; you slide the memory card into it, then insert into the computer as you would a floppy disk. The Sony Mavica line of digital cameras take an actual floppy disk as their removable memory. This is convenient as it immediately goes into any computer. Digital cameras have a way of deleting images while the memory card is in the camera; this bypasses the need to remove the memory card and download the images.

As far as viewfinders, there is a potential problem with an optical viewfinder. For digital cameras with no liquid crystal display (LCD), or when using an optical viewfinder, the same problem occurs as does when using a rangefinder 35mm camera. The problem is this: the photographer is looking through a window that is not connected to the lens. Therefore, when shooting close-ups, a parallax problem occurs: part of the image will be cropped because you are looking along a different plane than the camera’s lens is. (Appendix H, fig.1)

Exposure controls in a digital camera vary from camera to camera, but there are some cameras that have f-stop settings in a manual mode. The Kodak DC220 digital camera has a manual f-stop setting. This would be used in an instance where flash is not used. Most digital cameras have a built-in
30

flash. A few digital cameras have accommodations for an external flash.

Quality of image differs in a digital camera compared to a traditional, film-based camera. In a traditional camera, the sharpness or graininess (grainy is the technical term for fuzzy) is dependent on the film speed. A high numbered (speed) film will be much more grainy than a low speed film. In digital photographs, sharpness is translated to resolution. Most digital cameras have different settings for resolution: low, medium or high; sometimes known as good, better or best.

There are equivalent lenses in digital cameras as in traditional cameras: wide, normal, telephoto and zoom.

The rules of composition apply to digital photography in the same way they apply to traditional photography. The rule of thirds can be demonstrated (Appendix G). Show photographs that portray how different angles give the image different moods. Teach the students to crop in the viewfinder, not the darkroom. Lines (roads, railroad tracks, etc.) can lead the viewer's eye to the subject. Tree branches, doorways, windows etc. can be used as natural frames around subjects.

Lighting is the next subject in the lesson. Inside, with no flash, (available lighting) filters may have to be used corresponding to what type of lighting is used. A magenta filter is needed with fluorescent lighting, a blue filter with tungsten bulbs. Non-flash lighting in traditional photography uses external filters applied to the camera lens. Some digital cameras have settings that in effect apply filtration to a non-flash photo; for instance they might have
a fluorescent setting. The Kodak DC220 has these filtration settings.

There is one Kodak DC220 camera, one Sony Mavica MVC-FD71 camera, two Umax scanners and ten Macintosh computers to be shared by the digital photography students in Room 405 SEC.

Session 2: Digital Cameras

The Kodak DC220 Camera

Taking Pictures and Camera Functions

1. Make sure you have fresh batteries installed, or use the AC adapter. The camera will go through batteries quickly, especially if you view your photos with the LCD viewer.

2. Turn dial on back of camera (beneath the LCD screen and to the right) to "Capture". (Appendix H figure 2)

3. Press the silver "Power" button on the top right of camera. It will take several seconds to power up. (figure 2)

4. Aim camera at subject using viewfinder on back of camera (upper left) to frame subject. (figure 2)

5. Push black shutter release on top of camera. (figure 3)

Recording a Sound

1. After following the above directions, the photo will briefly display on the LCD screen. You can capture a sound during this display by pressing the "Record" button which is next to the microphone on the back of the camera. (figure 2)

2. You can add a sound to a picture at any time by
selecting it in the "Review" mode, then pushing the "Record" button.

Playing Back Images and Sound on a Television
1. Make sure TV and camera are turned off.
2. Use the AC adapter to power up camera: Plug yellow-tipped jack into port labeled “DC 7V-8V”. Plug other end into outlet. (figure 5)
3. Plug black end of AV cord into “AV OUT” port on side of camera. (figure 5)
4. The other end of the AV cord (one yellow jack, one white) plugs into corresponding jacks on the back of television.
5. Set mode dial on back of camera to “Review” (figure 2)
6. Turn on camera and TV.
7. Review pictures and sound using buttons directly below LCD screen.

Inputting Photos To Computer
1. Use blue G3 in TML. Make sure you have disk inserted in proper drive.
2. Plug USB cable into port next to AV OUT port in side of camera. Plug the other end of cable into USB port on left side of computer keyboard. (figures 4, 6 & 7)
3. Launch Adobe Photo Deluxe software. Click on "Get Photo"

4. Click on the "Get Photo" tab.

5. Click on the icon of the camera above the "Other" label. (The software finds the camera hooked up via the USB cord.)

6. Click "OK". A contact sheet pops up.

7. Drag the images you want onto the desktop.

8. Drag the images from the desktop onto your disk icon.

The Sony Mavica MVC-FD71

Taking Pictures and Camera Functions

1. Make sure the battery is charged by sliding it onto the charger with positive (+) and negative (-) terminals of battery contacting corresponding terminals on charger (BC-V615). (Appendix I figure 1)
2. Light labeled "CHARGE" goes out when battery is charged. As with other digital cameras, the LCD screen uses the battery faster than any other functions the camera has.

3. Open door to battery compartment on bottom of camera (marked "OPEN (BATT)") by sliding in direction of arrow (to the right and up).

4. Slide battery into compartment. Close door.

5. Slide floppy disk into camera with labeled side of disk facing towards back of camera. (figure 2)

6. Slide PLAY/CAMERA switch (under LCD screen on back of camera) to CAMERA. (figure 2)

7. Push silver shutter release button on top of camera to take picture. (figure 3)

Inputting Photos to Computer

1. Remove floppy disk from camera by pushing button marked "PUSH" and sliding switch in direction of arrow marked "DISK EJECT". (figure 2)

2. Insert disk into floppy drive of PC or Macintosh Power PC.

Images may now be manipulated with software such as Adobe Photoshop.

Session 3: Scanning Images

Using Umax Scanners

1. Open scanner lid. Place image to be scanned face down on glass. Close scanner lid.

2. Double click on Adobe Photoshop.

3. Under the "File" menu, go to "Import" then "Twain Acquire". The Umax software launches.
4. Click on the "Beginner" button.
5. Click on the "Preview" button. Preview will begin.
6. Choose type of media to be scanned from list: Color Photo, Print matter, Text/Line Art or Web Image.
   Click on appropriate button.

7. Under "File" menu, go to "Save As" and put in your folder or disk.

Using Adobe Photoshop

To me, the software to manipulate digital images is the alternative to a darkroom in traditional photography. This is a basic instruction of Adobe Photoshop.

There are many commands in the Photoshop program that correlate to traditional photography actions. For instance, the cropping tool in the Photoshop program works the same as raising and lowering the enlarger head in a traditional darkroom. The dodge tool in Photoshop is represented by a symbol that looks just like a traditional dodge tool. There
is a menu command that works just like exposing a print
longer (darken), as well as the opposite (lighten).

To teach Adobe Photoshop, the instructor would need a
computer, the Photoshop program and an illustrative text for
each student. I have explained the Photoshop tools below with

· The Marquee tool allows a rectangular selection of the
  image to work on.
· The Lasso tool allows a freehand selection of the image to
  work on.
· The Airbrush tool creates a path that looks like spray
  paint.
· The Rubber Stamp tool clones the path created with the
  mouse.
· The Eraser tool erases!
· The Smudge tool smudges the path made with the mouse.
· The Pen tool draws curved or straight paths with the mouse.
· The Measure tool measures distances.
· The Paint Bucket tool fills areas with a chosen color.
· The Hand tool moves the image within the window.
· The Move tool moves a layer, selection, or guide.
· The Magic Wand selects similar colors within an image.
· The Paintbrush turns the mouse's path into brushstrokes.
· The History Brush "undoes" or deletes an action.
· The Pencil uses the mouse to draw freehand lines.
· The Dodge tool lightens areas within an image (using
  mouse).
· The Type tool creates editable type on its own layer.
· The Linear Gradient blends color.
· The Eyedropper sucks color from a selection within the image.
· The Zoom tool enlarges or reduces the image view size.

There are many filters that Photoshop has to choose from. "Photoshop's filters can be used to produce a myriad of special effects, from slight sharpening to wild distortion...Filters are grouped into thirteen submenu categories under the Filter menu." (Weinman & Lourekas, 1998, p. 241)

The Photoshop instructor should explain the basic tools as described above, then let the students experiment with the many and varied permutations of the application. The main benefit of working with digital photography is that unlike traditional photography, each action can be "undone", thus facilitating rapid absorption of the instruction.

Final saving of the image depends on what use there is for it. To preserve the ability to continue manipulation, the image can be saved in a Photoshop file. An image can be saved as a GIF (line art) or JPEG (continuous tone such as a photograph) format so that it can be used for internet or e-mail applications. To place an image into a layout program such as Adobe PageMaker or Quark XPress, an image can be saved in the EPS format (continuous tone image such as a photograph) or the TIFF format (line art). Multi-media adaptations are also possible by converting a Photoshop file to an Indexed Color mode.
Sessions four through eight should entail the students taking turns taking photos with the digital cameras, scanning traditional photos in with the scanners, and manipulating images with Adobe Photoshop. The instructor should be present in Room 405 to assist the students.
Appendix C Traditional Camera

Shutter Release

Viewing and Taking Lens
Appendix D F-stops

(Alesse, 1998)

The aperture has various settings called f-stops. F-stops generally range from a setting of f/1.4 or f/1.8 the largest opening, to f/16 or f/22 the smallest opening.

This page shows photos of each f-stop. You can see how the size of the aperture openings change from setting to setting.
Appendix E Depth of Field

(Alesse, 1998)

**depth of field....**

This photo shows a short depth of field. The lens is focused on the 2 of spades. The other cards are noticeably out of focus. The aperture setting used was f/1.8, a large aperture.

In this photo the depth of field includes all the cards. Its aperture setting was f/16, a small aperture. In both photos, the lens was focused on the same point, the 2 of spades.
Appendix F Shutter Speeds

(Alesse, 1998)

faster shutter freezes action....

In this photograph a fast shutter speed of 1/100 sec. was used. You can see the action is frozen.

If a slower shutter speed is used such as 1/30 second, the action is blurred. Usually when a photographer is hand holding his or her camera, 1/20 sec. is the slowest shutter speed that can be used. If the shutter is slower, the image is quite often blurred by the body movement of the photographer.

slow shutter blurs action....
Appendix G Rule of Thirds

(Eastman Kodak, 1984)

To understand the rule of thirds, imagine two horizontal lines cutting the picture into thirds. Then imagine two vertical lines cutting the same picture into thirds vertically. The intersections of these imaginary lines suggest four possible options for placing the center of interest for a pleasing composition. Neuschwanstein Castle, West Germany
Appendix H Kodak DC220

Figure 1

Figure 2
Shutter Release

AV Port

USB Port

AC Adapter

Figure 3

Figure 4
Figure 5
Appendix I

Figure 1

Charger and Battery