

## **EDUCATIONAL APPLICATIONS OF DIGITAL PHOTOGRAPHY**

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### **THE DIGITAL CAMERA: ADVANTAGES AND DISADVANTAGES**

A digital camera is an electronic device that digitizes images. The focus of this paper is the portable handheld digital camera for still imaging. Advantages of digital cameras over film cameras include higher speed of producing useable images; instant availability of images for output to print, video tape, or an image file. Digital images have multiple uses such as in computer applications like printed documents and presentations. Ease of duplication is another advantage of digital photography. Prints and computer files can be copied indefinitely at very low cost. In addition, savings result from never needing film or developing. Space is saved because images are stored in digital form. Prints are created using standard computer and printer hardware with no additional equipment needed. Image appearance and quality are easily controlled using software included with cameras.

For some situations, digital cameras are at disadvantage compared to print and slide film cameras. For computer use, digital camera image quality is close to standard VGA quality. Further disadvantages concern convenience, because photography requires the user to do all processing work. Digital image quality is generally lower than film, and high quality digital photography is expensive. Although processing is very low cost, the price of cameras can be high, with consumer models ranging from \$100US to \$3000US.

### **EDUCATION USES OF DIGITAL PHOTOGRAPHY**

Digital photography can meet many needs in support of education. Student and staff identification photos or badges can easily be printed and updated. Photos can be produced for students' files and school records of equipment and events. Photos of school property for record keeping, documenting crime or vandalism, and insurance inventory can be kept efficiently. Digital photos can be displayed in a variety of formats including posters, multimedia displays, presentations of student activities or projects. Work for open house, awards night, and fairs can be displayed digitally. Take pictures for school newspapers and local broadcasts, or even a digital yearbook.

In the curriculum area, digital photography allows electronic field trips using stored images shown in the classroom or uploaded to a world wide web page. Photos of important sites can be shown in advance of a live field trip in preparation. Review field trips with pictures to show all students the sights and discuss learning, as well as sharing the trip with others. Create assignments with pictures to illustrate actual items and processes that are used in the class. Digital photos are useful for showing missed information to absent students, or e-mailing them images from the classes missed. Examples of classroom applications of digital imaging are photographing measurements, instruments, sports equipment or positions, recipe ingredients, pictures for vocabulary or reading lessons. Supplement work sheets with pictures specific to the course. Most digital cameras may be used with lenses or other optical instruments (microscopes, telescopes, etc.) to make certain images available to the entire class or to create animations or time lapse series of processes like eclipses. Customize displays and bulletin boards with photos from school, lab, classroom, or student performances. Students can create presentations using their own recorded images. Classes can include

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pictures in their correspondence with donors, volunteers, business partners, guests, and parents.

In assessing learning, digital photography is effective in both traditional test construction and in production of alternative assessments. Include students' photos and images of their 3D and performance work in portfolios. The pictures allow documentation of a greater variety of work than would otherwise be included in a portfolio. Create more authentic evaluations including images of items or processes from actual class experience.

### USING OF THE DIGITAL CAMERA

Taking pictures with most digital cameras is just like taking pictures with a standard camera: just point the camera and push the shutter button. Most digital cameras have viewfinders but some have LCD (Liquid Crystal Display) screens that display the image before recording. An advantage to the LCD is the ease of deleting stored images from camera memory without the need to connect the camera to a computer. Unlike standard cameras, instead of storing pictures on film, digital cameras use digital computer memory. Digital camera memory limits vary and may be supplemented with memory cards or special storage disks. Adding a memory card usually costs more than \$200US. All cameras have a delete feature, which may allow you to delete selected images, or may require that the entire memory must be deleted. Some cameras allow images from a computer to be saved as photos in the camera for use in print or video applications.

Digital cameras usually connect and download to a computer running a camera/imaging program. Some cameras require an additional computer hardware card installed into the computer, some cameras use the computer's serial or parallel ports, while others download through infrared, and some connect directly into a computer slot. A few digital cameras have video output that allow the camera to send out a video signal directly through a video to a television or video cassette recorder.

All digital cameras save pictures in a digital file format, which may be camera specific or standardized. The format that pictures are saved in will determine the amount of disk space needed to save a picture. Picture storage formats can be converted using a graphics program. If the camera has the ability to output a video signal, video tape can be used to show or archive pictures.

Stored images can be printed using dedicated photo printers or standard black and white or color printers. Laser or inkjet printers are most effective. Now print cartridges, glossy paper, and iron on transfers are available for printing photos with inkjet printers.

### APPLICATIONS FOR DIGITAL IMAGES

After digital images have been transferred from the camera to a computer, the images can be e-mailed as attachments. Images can be sent using the computer's fax/modem to any fax machine. Images can be incorporated into print, such as posters, signs, reports, banners, certificates, and any other publishable print document. Iron on transfers allow images to be printed on items such as T-shirts, aprons, banners, flags, etc. Depending on the features of the camera, images can be put directly onto video for presentation without a computer. Images can be added to word-processing documents and presentations. Images can also be included on homepages for the World Wide Web. Images should be converted into GIF or JPEG format for the World Wide Web.

### ACCESSORY EQUIPMENT

Almost any printer can print images, but for the best quality, a high resolution ink jet or laser printer is recommended. New photo printers are available. Most cameras include their own cables for connection to either a PC or Mac platform computer, and some cameras include the cables for direct video

output. It may be necessary to purchase cables, but it is possible to construct them with parts from an electronics store. Most cameras include an image handling software program. Depending on the software, the options may be as simple as view and save, or may have numerous picture editing capabilities. Pictures can be used with the popular graphics & imaging software programs, such as PhotoShop® or Corel Graphics®. Images are often large files and saving them can use large amounts of disk space. It is possible to save the images in compressed formats like JPEG or GIF, and save disk room. For saving lots of images, an external drive is recommended.

#### COMPARING DIGITAL CAMERAS AND OTHER DIGITIZERS

A flatbed or hand held scanner is an alternative to a digital camera, but it is not portable, and often involves more steps in getting a digital image. For someone who digitizes few images and has access to a scanner, it is a reasonable option. There are low cost digital cameras that are tethered to a computer. Cameras such as the QuickCam® must be physically connected to a computer to work. When taking pictures within sight of a computer, these cameras work well. These cameras are also useful for computer video conferencing and can make short digital video files. Inexpensive video digitizers, such as the Snappy®, can convert a signal from a video recorder or video camera and then digitize the image as stills or motion video. For converting standard slides and photos to digital format, a Photo CD® can be produced commercially. The processing costs for Photo CDs can be high (over a dollar an image). Some photo labs will develop film and send out digital copies on floppies or by e-mail with paper prints.