Ten Tips to Aid Teachers Creating Multimedia Presentations

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Great disparity currently exists in the educators' definitions of multimedia. Many have bought into the very clever marketing ploys of hardware and software distributors who describe multimedia as a machine that accesses compact discs. However, multimedia is not just defined by a set type of hardware and software. Rather, it is an umbrella term that describes interactive collections of different types of media (e.g., photographs, video clips, and sound) under user control. These types of media are selected and edited from a variety of sources (e.g., digitized images, animation sequences, film, video presentations, and slides), and they tell the user a story or permit the viewer to witness some action or event and benefit from the experience. The basic elements for creating any multimedia system are a capturing device, a digitizing device, and an output device. The key to success is the multisensory appeal of this medium. Images and sounds that are singly meaningless are combined through the use of an authoring system and instructional design techniques to create a meaningful educational or entertainment experience. Multimedia presentations show the viewer a combination of images and sounds that tell a complete story. Now that multimedia is popular, every company wants to capitalize on it.

Multimedia has its foundation in entertainment; it must be planned and evaluated thoroughly before it becomes a successful part of the teaching and learning environment. Today's CD-ROMs, huge hard disks, and high-resolution, high-speed video cards make it possible to store, access, and display enormous amounts of data. Even games are now available in CD-ROM formats. Software used to create multimedia presentations must also be capable of handling large files, manipulating and using data in a variety of formats, and quickly accessing sound and video clips.

Empirical research on the value of multimedia in learning environments is needed. More research that examines the learning potential of students exposed to multimedia is needed (Toomey & Ketterer, 1995). Many teachers use multimedia as a tool for enhancing instruction, self-discovery, inquiry, and information transmission. Others use it as a vehicle for creating presentations that can be shared with peers. The latter requires training, skill, and the ability to use the computer to control other peripherals. Depending on their learning styles and time constraints, some teachers learn to create multimedia projects through self-study, others learn from their peers or students, and still others attend formal classes (D'Ignazio, 1991). Teachers who are successful in using multimedia find ways to use multimedia to make presentations, transform textbook material, conduct original research, and make tedious content more appealing. The following sections describe 10 tips that may be helpful for teachers creating original multimedia presentations and lessons.

Tip 1: Build A Resource Team
The team approach to building, analyzing, and incorporating multimedia into the learning environment is invaluable. Building multimedia products is a job that requires a lot of experience. Domain or content specialists, producers, script designers, art directors, computer specialists, and communications analysts are just a few of the essential players on any multimedia team. Each position provides the planning, execution, communication, analysis, and skill needed for the product's success. The analysis and incorporation of multimedia into a learning environment should also use the team approach. Several product users with some level of expertise should evaluate the product for content accuracy; learning curve; cosmetic appeal; use of video, digitized images, and sound; communication; interactivity; learner control; cost effectiveness; curricular relevance; and the degree to which the product lends itself to classroom uses and activities. The team approach also provides support for potential users and addresses other pertinent issues (e.g., access, distribution, and scheduling) regarding the use of this medium.

Tip 2: Be Aware of Intellectual Property and Copyright Issues
Multimedia developers need to be aware of the legal and intellectual property issues involved when developing a new product. Because multimedia combines different media (e.g., text, music, video, film, and animation), different laws are applicable to protect the copyright owners of these original works (Helyar & Doudnikoff, 1994). The use of text is protected by copyright, defamation laws, rights of privacy and publicity, and trademarks. Music also has established copyright laws and clearinghouses through which individuals obtain the rights to use recorded songs by paying licensing fees. Video and film have even more protection from unauthorized use, including contracts, labor laws, moral
rights, copyrights, trademarks, rights of privacy and publicity, and defamation laws. Animation and graphics are also protected by copyrights, trademarks, and moral rights. Currently, a copyright on a new work lasts for a minimum of fifty years. When the copyright expires, the work becomes a part of the public domain. If clips of art, sound, music, animation, or video are not public domain or if their use cannot be classified as fair use, the individual using these items without proper permission has violated copyright laws. Fair use categories include news reports, teaching (nonprofit educational uses), research, and scholarship (Helyar & Doudnikoff, 1994). It is advisable for instructors developing multimedia products to determine the ownership and liability issues inherent in using media works produced and developed by others. This information should be gathered during the product's initial development phase, and appropriate licensing information and legal counsel should be obtained.

Tip 3: Thoroughly Analyze Your Targeted Audience
Well-structured multimedia presentations can be valuable for learners. Often, clarification, visual stimulation, information transmission, and retention can be enhanced through multimedia (Rockley, 1994). However, these benefits are dependent upon the degree to which the presentation meets the needs of the targeted audience. An audience analysis helps match content with user needs. Information about necessary prerequisite skills, lesson depth, presentation method, and learner skill and expertise can be gathered from an audience analysis. Once a profile of the audience is developed, instructors developing multimedia have an idea of who the user is, what he or she knows, and whether or not content should be adjusted to match specific learner needs. This provides a framework for structuring and organizing the presentation.

Tip 4: Carefully Select Media That Complement Instructional Content
The use of video, graphics, photographs, sound, and text should match the learner's needs and the content being presented. One word of caution, however: Copyright issues should be resolved before any media is incorporated into a multimedia production; see Tip 2 for more information. Video should be used when realism is desired, and the user should be able to alter the pace of the video sequences. When historical events or the contributions of legendary figures enhance the learner's understanding or clarify events of a time period or scenario, video clips are a good choice. Graphic images and photographs can be useful for visually representing detailed information. Both should be used to show places and people and provide meaningful information (Rockley, 1994). Visual imaging can help learners put content into perspective, and it can also aid retention and recall. Users should be allowed to enlarge images, and any accompanying narrative should be a secondary source of information. Music or sound clips added to multimedia presentations should be clear, inoffensive, and under user control. The volume should be adjustable, and the use of sound optional. Sound clips work well when they are presented with text or narrative. Sound should be used sparingly so that it does not become a distraction. Text should be combined with other media. It should not be extremely lengthy or turn the multimedia production into a "glorified page turner." Textual sequences should be informative; contain instructions; and provide clear, concise, and unambiguously worded reference material to the learner.

Tip 5: Take Into Consideration Hardware and Software Requirements
A multimedia presentation can be created with minimal system requirements. This includes the following:

- A 16 MHz 80386SX or higher processor.
- 4Mb RAM (however, 8Mb or greater is recommended).
- A high-density disk drive (1.4Mb).
- A hard disk with 4Mb or greater available disk space.
- A VGA monitor and graphics card.
- A Windows-compatible mouse.
- DOS 3.1 or higher.
- Windows 3.0 or higher.

If a more powerful system is needed, try the Macintosh platform, including the following specification and peripherals:

- Apple Power Macintosh 8100/100 computer.
- Canon Xapshot camera.
- MicroTek Scanner.
- Panasonic Video Camera.

Software might include HyperCard 2.3, HyperGASP 2.1.1, and Adobe Photoshop 2.0. If investing in an MPC, consider the Tandy Sensation, a 486SX 25 MHz MPC that sells for about $1,700. If purchasing a standard CD-ROM drive, make sure it has at least single-session Kodak PhotoCD compatibility (although
multisection is preferable). CD-ROM drive standards are changing so rapidly that it's easy to become confused. Ideally, what is needed is the following:

- A PC with an 80386 processor (or higher).
- 640K of conventional memory plus 1024K of extended memory.
- A 100Mb or larger hard drive.
- An SVGA graphics card and monitor.
- A two-button mouse.
- A CD-ROM drive.
- An audio board with speakers or headphones.
- A MIDI I/O port.

For maximum PC efficiency, upgrade to MS-DOS 5.0 and Windows 3.1 or higher, and purchase multimedia software. Some multimedia applications are furnished when you purchase an MPC (Dyrl & Kinnaman, 1995).

Tip 6: Seek Technical Support From an Experienced Multimedia Developer
Seek technical support from an educational technologist or curriculum specialist knowledgeable about developing multimedia products. Instructors interested in developing multimedia products should have the opportunity to create products that satisfy their needs. Common sense and effective technical support can eliminate frustration and permit instructors to develop effective multimedia presentations that supplement and enhance their current classroom instruction. Consultations with experienced developers can also reduce costs and save time and energy.

Tip 7: Encourage Distribution of Multimedia Projects on the World Wide Web
In the future, multimedia will be delivered over new information appliances that will combine today's computer, telephone, and television. The World Wide Web offers a good preview of the types of documents teachers encounter on the Information Superhighway. Using browsers, such as Mosaic, Netscape, and their successors, allows educators to search libraries and access real-time information all around the globe (Saltzberg & Polson, 1995). This encourages collaboration, research, and feedback in higher education. Those who create and distribute multimedia projects through this medium gain valuable feedback from their peers as they seek to develop instructional aids (Taalab, 1995). The Web, by its very nature, distributes resources and information, making it the tool of choice for educators interested in delivering multimedia instruction using a distributed learning model. For the uninitiated, a good place to start to look for these examples is the World Lecture Hall. The Web address for this resource is http://www.utexas.edu/world/lecture (Saltzberg & Polson, 1995). The Web allows collaboration among those in the same and different content domains. It is also an effective avenue for cross-collaborative efforts in multimedia design and production. A Web page can incorporate hypertext, images, sound, video, animation, and the delivery of binary versions of spreadsheets, presentations, and other documents. An instructor can create an Astound, Power Point, Persuasion, or Excel spreadsheet from a Web page, and it can be viewed by students from their desktops (Saltzberg & Polson, 1995). As the bandwidth of the Internet continues to expand, and as Internet technology increases in sophistication, the incorporation of dynamic multimedia technology and video means that educators will have the ability to teleconference directly into Web pages. This increased use of multimedia in education means that faculty can deliver extremely sophisticated instructional materials directly to students at various sites as easily as they send e-mail.

Tip 8: Organize a Multimedia Presentation Using a Storyboard
Before organizing any information, a hierarchy should be developed. The hierarchy determines the order in which the information will be presented. If a hierarchy seems difficult to develop, using a storyboard will be helpful. More elaborate storyboards remove guessing from product development and allow creators to place information in the proper sequential order to best accommodate the audience. It is most helpful to work the idea out on paper prior to beginning the production. A storyboard may be as elaborate as a television script or it may be a series of descriptive names assigned during a coding phase (Orr et al., 1994). The elements of the storyboard may include mnemonic names and objects. These names may direct the production to a particular segment or laser disc or a visual image stored within the program (Wodaske, 1994). A storyboard may also be a sequential listing of images or video along with corresponding audio. These scripts can be as lackluster as a list of topics covered in the production. More elaborate storyboards for linear editing include The Scene Editor in Media Merge from AT&T, which shows composite results as well as video clips, and The Premiere interface in Adobe Premiere, which has its own timeline.
arrangement and includes as one of its strongest features a transitions window. The most important thing to remember is that a plan that helps organize and arrange the information is essential.

Tip 9: Choose Design Elements
When working with a visual medium, organization is more than logical order. One can organize and classify by color, size, positioning, and other visual elements. These kinds of enhancements make the presentation easier to use (Rosenborg, Green, Hester, Knowles, & Wirsching, 1993). A visual presentation is anything that is perceived through sight (Thompson, Simonson, & Hargrave, 1992). Multimedia presentations are designed to appeal to the user’s senses. Their primary purpose is to communicate information visually and audibly. The design elements that make up any picture are lines, shape, texture, space, color, balance, and unity. Balance refers to the weight of the design elements on the visual display and can be either symmetrical or asymmetrical. Design elements should be arranged such that both halves of the design screen are perceived evenly. In symmetrical balance, both sides of the image should contain the same number of elements that are the same size. In asymmetrical balance the elements of both sides of the image are not the same; however, the elements are placed on the screen so that they create an equilibrium and a sense of balance. Unity creates a relationship between the elements of the production. This should be done to make sure all the design elements are perceived as a functioning unit. The most important concept to be communicated should be positioned so that it is the focal point or center of attention (Kemp & Smellie, 1994). Multimedia presentations that utilize pictures, diagrams, stills, video, laserdisc, motion clips, and animation sequences should be used to explain an idea or concept. Multimedia in education should be used to communicate ideas and enhance the learning environment.

Tip 10: Test Your Presentation
Testing your presentation can be a difficult part of the product-creation cycle, but it is extremely important. Develop a thorough procedure for testing hardware, software, and the performance of the presentation under varied conditions and system configurations. Establish testing procedures before you begin to develop the multimedia presentation. The testing protocol should outline all components to be tested. The plan should describe how errors will be resolved and documented any problems. When possible, the presentation should be tested in batches. Multimedia applications get very large; compiling the entire presentation could take more than a day or even longer. By testing modules of the presentation over the course of development, the number of compilation errors can be reduced significantly. The presentation should also be tested with several different system configurations. Applications created using multimedia authoring tools put a big drain on available system resources. Be mindful of memory limitations and other resource constraints.

Conclusion
Recent developments in technology have provided many options for multimedia (which is the user-controlled computer delivery of a variety of media, including text, still graphics, moving images, and sound). User-friendly authoring programs have been developed so that interested teachers can develop their own multimedia programs for instruction (Teague, Rogers, & Tipling, 1994). Caution must be observed to ensure the quality of these presentations. Also, the legal, ethical, and intellectual property implications of using various media must be addressed. This handy list of tips for creating multimedia may prove helpful to those teachers who seek to develop multimedia applications that broaden the delivery of their instructional content and provide their students with experiences that far exceed typical class lectures.

References

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