

Multimedia is one of the more powerful strategies for technology in the classrooms of tomorrow. This article focuses on the potential of multimedia to alter learning environments in public schools. This author presents a field tested model and six step plan for using multimedia in the classroom.

Multimedia's Potential in 21st Century Learning

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Multimedia is an expanding, powerful technology that provides learner control over a vast array of resources. Multimedia encyclopedias, databases, and instructional courseware provide classrooms instant access to available sounds, imagery, and text to make concepts come alive. Learning can be made more vibrant, collaborative, exciting, and memorable through teacher-produced student-produced multimedia projects.

Research has proven that learners who *see, hear, and interact* with content area material not only remember what they learn, but also understand it (Ward, 1994). Students whose learning styles do not respond to the traditional teaching styles can be stimulated and motivated to learn through the use of multimedia.

Technology Integration

Technology integration into our society is escalating at a rapid pace. While technology can be seen in homes, area businesses, shopping malls, and banks, it is missing in many classrooms across our nation. Schools apply today's technology in varying degrees. Making technology available to all learners has become an essential part of providing appropriate public education to all Americans.

What is a successful education for students in today's classrooms? This question is the real challenge for educators of today—to determine what students need to be taught now, that will make them productive, successful citizens in a changing world. The problem lies in the fact that while the world is changing from an industrial-age society to an information-age society (Naisbitt & Aburdene, 1990; St. Onge, 1993), schools lack any visible change (Bell & Elmquist, 1991; Cardell, 1993; Perelman, 1990). Little or no use of technology seems to be the norm. Students today need technology training to be able to function in the world of the future (Bell & Elmquist, 1991; Bruder, 1990; Dwyer, 1994; Mecklenberger, 1990; Pearlman, 1991; Perelman, 1990; Sheingold, 1991).

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Technology use shows great promise in serving as the catalyst for change in America's educational system (Bell & Elmquist, 1991). Preparing students for the future world of work will include the use of technology. Utilizing multimedia in the classroom is one way to help students become motivated to learn and become independent lifelong learners (D'Ignazio, 1994; Dwyer, 1994).

Multimedia Benefits Students and Teachers

Multimedia is defined as the integration of visual, graphic, audio, and textual information through the control of a computer. Multimedia is a powerful tool that allows the user (teachers or students) to track through vast amounts of varying types of information (Bruder, 1991; Burroughs, 1990; D'Ignazio, 1990; McCarthy, 1989). Technology's power is in the user's being able to view information in a non-linear fashion. The computer can be used to access a videodisc that plays a motion video image and retrieves auditory, graphic, and text information from a database, dictionary, or encyclopedia.

Using multimedia in the classroom, teachers create exciting and effective learning environments where students become actively involved in their own learning process. Multimedia provides new opportunities for students with varying learning styles. Multimedia is an ideal multisensory presentation platform, employing motion video, still images, audio of various types, text, and graphics that benefit many students.

Learning becomes an active process where students use the technologies to communicate their understanding. Students' use of multimedia presentations is one way to stimulate self expression. Teachers have found that multimedia projects are a good way to motivate students because when students become involved in multimedia, they become excited and self-motivated (Mageau, 1994).

Multimedia can be accomplished on various levels of sophistication depending on the equipment that is available. This means that multimedia can be as simple as students preparing a video book report by using a cable connector and a computer linked to a VCR, with a tape recorder providing sound by being plugged into the audio jack. Creative teachers and students can experiment with various technologies using different components to advance to a higher level of sophistication. Teachers can begin to integrate video cameras, digitizers, and graphics to create student video presentations. In advanced multimedia, students can utilize multimedia data bases to collect and sort images, special effects, sounds, narration, and use the computer to organize, store, and present information.

When teachers use multimedia, they have noticed students spending more time on learning tasks with fewer discipline problems, because they are actively engaged in the learning process (Ambron & Hooper, 1990). Characteristics of using multimedia in the learning process include: a new potential for motivating students, an ideal forum for cooperative learning; a multimodal avenue to learning; the ability to break information down into bite-size chunks; a match to associative, non-linear thinking processes; active participation of the user by user control of the computer's path; the potential of familiar media types to keep students focused on a task; the platform for students to be expressive in forms other than written text; and the relative ease in orienting students to the functions of multimedia software (Ambron & Hooper, 1990; McDermott & Combs, 1991).

Teachers with limited funds need to look around or scavenge (D'Ignazio, 1990) to see what equipment is already available in the school. Most schools possess tape recorders, VCR's cameras or camcorders, which provide a beginning for using multimedia. After finding whatever equipment that is available, pull the available pieces around your computer. Experiment with connections to see what can be possible with the connected equipment. Start small, think big.

Multimedia can be used in every subject area. Students can create and illustrate story problems in math using the computer, and then linking the computer to a VCR, overhead, or TV, so the whole class can participate in the solutions of the story problems. History and science reports can be made into multimedia presentations which makes excellent group projects. Curriculum areas can be integrated to include the language arts with the science and/or the history. The possibilities are limitless.

Multimedia emphasizes teaching across the curriculum making connections from smaller topics to larger topics. A benefit of using multimedia is the opportunity to have children working and learning together. Multimedia makes it possible to teach children to interact with one another, which can be one tool in preparing students for the world of work.

Multimedia as a Learning Tool.

An instructional application that combines a wide range of media (sound, video, images, text) to convey content to the student is only as good as the way it is used. When used simply as presentation devices for transmitting massive amounts of data, multimedia technologies add to the "information overload" already experienced by many teachers and learners. But when these technologies are applied instead as tools for structured inquiry based on higher-order thinking, users actively create their own mental models (Kozma & Croninger, 1992).

There are two main uses of multimedia in the classroom: as an instructional or lecture tool for the faculty member, and as a learning tool for student use. The latter is the ultimate use for multimedia. Multimedia is a challenge and can be an opportunity to experiment with new classroom teaching and organizational methods that increases students' productivity and encourages active learning. With the use of new teaching methods, the classroom can move from a teacher-centered approach to a student-centered approach.

Technology enables teachers to create materials by combining visual, textual, and auditory information into multimedia instructional lessons. The role of the teacher becomes that of a facilitator of learning rather than a deliverer of information.

The ultimate use of multimedia for enhancing learning is in the hands of the students. Technology-based activities provide opportunities for experiences using higher-order processes across several traditional disciplines through development of projects based on a core theme. Recognizing the interaction among restructured learning experiences, curriculum, and teachers, technology's impact on the end product of that interaction will be changed learning experiences for students.

Planning for Multimedia

Howles and Pettengill (1993) presented a seven-step approach to designing an instructional multimedia lesson. This seven-step approach can be used by the teacher in designing teacher-directed lessons using multimedia, or it can be used by the student in planning a student-centered multimedia project. The seven steps are:

- STEP 1: Select potential lessons for multimedia enhancement
- STEP 2: Describe specific learning outcomes for a lesson
- STEP 3: Create an outline for the sequence of the content
- STEP 4: Identify and list specific materials to be used
- STEP 5: Explore multimedia techniques for presenting content
- STEP 6: Develop a storyboard for the multimedia lesson
- STEP 7: Produce the lesson using multimedia authoring software

The creation of a multimedia presentation takes planning with careful attention to scripting, theme development, sequencing, and visual design.

Step 1 is to choose a lesson that can be enhanced by the use of multimedia. The greatest advantage of using multimedia for delivering classroom presentations lies in its capability to add visual impact to a presenter's verbal commentary.

Step 2 asks the developer to write specific learner outcomes. What do you expect the learner to be able to exhibit following this presentation?

Step 3 is to create a written outline for the sequence of the content of the lesson.

Step 4 is to specify and list all materials to be used in the lesson. The library media specialist could help in gathering all available materials needed on a specific topic.

Step 5 is to explore multimedia techniques for presenting content. The multimedia presentation should enhance learning.

Step 6 is to design a storyboard for the multimedia presentation. This storyboard would be similar to a blueprint in showing how the lesson will develop through the use of multimedia.

Step 7 is the actual production of the lesson—putting it all together to make the multimedia product that will enhance teaching and learning.

The production of the multimedia lesson takes time and planning. Multimedia is a method that should be used occasionally when adding visual elements such as motion video, graphics, and colorful text and diagrams that would enhance the learning of the concept to be taught. These seven steps should first be mastered by the instructor when preparing multimedia presentations to the class. After the teacher masters the process, then students should be taught the seven steps so they can learn how to make multimedia presentations to the class when reporting on material that has been researched.

Model for Learning to Use Multimedia

Learning to work together as a team is becoming more and more important in the work force. The Secretary's Commission on Achieving Necessary Skills (SCANS) report lists as one of the competencies needed for solid job performance to read as follows: "They can work on teams, teach others, serve customers, lead negotiate, and work well with people from culturally diverse backgrounds." Since the focus is being placed on teamwork, a good model for using multimedia would be a team approach. The multimedia team can become a cadre working together to implement the use of multimedia in the classroom. The model looks like this:

	Computer Facilitator
	Video Camcorder Facilitator
TEAM	VCR Facilitator
	Music Sound Audio Facilitator
	Software Facilitator

The team consists of five members. Each member of the team will become the facilitator for that particular piece of equipment and will serve as the trainer to train the other four members of the team in the use of that particular piece of equipment. When all five members of the team become familiar with each piece of equipment, this team can serve as an advocate for using multimedia for teaching and learning.

STEP 1: Each person on a team of five should work with and become very familiar with a specific piece of equipment that is used for multimedia presentations and productions. This may take outside training or enough time to really work with a specific piece of equipment to see the capabilities in a multimedia presentation. The school administrator may be one of the experts on one of the areas of multimedia and should be involved in the process to offer support. Allow adequate time for this process.

STEP 2: The facilitator can then train the other four members on their specific equipment until all are fairly comfortable and knowledgeable about the function of each piece of equipment. The other four people do not need to be expert in the

use of all of the equipment, but should be able to have a working knowledge of the functions of the other four pieces of equipment.

STEP 3: Provide time for the five-member team to get together to build trust and rapport as a group, to solve problems, and to make decisions about how multimedia can enhance teaching and learning. Allow them to exchange ideas, communicate openly, and really listen to one another. Through brainstorming, prioritizing, and consensus building, this group can generate many useful ideas in how teachers and students can use multimedia to enhance teaching and learning.

STEP 4: Begin experimenting with how the equipment can be connected and manipulated by the computer. Team members need to become risk-takers and inventors. Try out all pieces of the equipment to see how they can be used together to get audio, visual, and graphics.

STEP 5: Work together with the software programs that are available. *VCR Companion* or *Hyperstudio* would be good beginning programs to work with. There are other programs available that will work with the multimedia equipment in merging text with pictures.

STEP 6: Experiment with the developing and producing of a simple multimedia project about the school, community, or other topic of interest to the area that could be presented to the entire staff during the fall staff development meetings. Let the multimedia team explain the process in getting this presentation together and suggest the availability of the team members to help others learn about multimedia.

STEP 7: Continue to meet together as a team of five during the school year for the purpose of offering support, sharing ideas, helping one another with classroom uses of multimedia and evangelizing the results to the rest of the faculty.

The goal of team building in a school community is to produce a sense of camaraderie so that those who work in the same building will be prepared to cooperate in new ways in the pursuit of common goals that will lead to better education for children (Maeroff, 1993). The promotion of the use of multimedia in the classroom for enhancing teaching and learning is the goal, and the multimedia team, through cooperation and continued encouragement and support from school leaders, serves as the catalyst to make this goal become a reality.

Multimedia is a method that can enhance the teaching and learning process through the use of cooperative learning, presentations, thinking, and problem solving. With multimedia, learning becomes an active process with the students doing the work and needing only to be guided by the instructor.

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