

Reaching All Students

A Step-By-Step Guide to Using Multimedia Tools in Special Education



CRC-15

One of the greatest challenges facing educators is how to reach each student despite varied abilities and learning styles within the classroom. Using multimedia to educate students with disabilities can be key to overcoming this challenge.

Technically speaking, “multimedia” is defined as presenting information through a variety of methods—using images, sound, text and video. Each of these methods of information can be combined with the others in a variety of ways to more effectively reach all students in a classroom situation.

Multimedia tools promote inclusion. For a child with a disability, a multimedia classroom can mean the difference between understanding and confusion. Because of the large selection of easy-to-use multimedia products available today, there has never been a better time to use these tools to promote inclusion and accessibility for all children in the classroom.

Most people encounter some form of multimedia every day. From Web sites to DVDs or audio to visually supported texts, multimedia is available to both teachers and parents in many subject areas. Multimedia presents information in an exciting and informative way, resulting in a fun and interactive learning experience for users of all ages and abilities.

In the classroom, teachers use multimedia to demonstrate key concepts with visual or audio components that engage learners. Through this simple technology, multimedia can enhance the educator’s teaching style. In addition, teachers can use multimedia in classrooms as both an assessment tool and as a way to ensure accessibility for all students through Universal Design for Learning (UDL).

Teaching, Assessment and Access Through Multimedia

Recent studies prove that not all students learn from the same teaching style. This is especially true for children with disabilities. By using different techniques, teachers can appeal to a larger audience than

by the traditional lecture-format alone. Adopting a “one style fits all” strategy of curriculum design is a sure way to guarantee that students with disabilities be neglected in the educational process.

Using visual aides, sing-along music and supportive videos to supplement instruction are best practice methods to engage students on many different levels. With the advancement of computer technology, digital (computerized) multimedia design can be a very powerful addition to the more traditional teaching tools.

Multimedia can also be used as an assessment tool in many situations. Young learners can use multimedia to:

- Demonstrate that they understand instructions.
- Discriminate between different shapes.
- Enhance communication through building sentences or using picture-symbols.

Older students can use multimedia to develop projects for any subject area. These projects are well-suited for team-learning and can incorporate multiple learning and communication styles, as well as demonstrate organizational skills.

Multimedia can provide access to the curriculum and incorporate UDL for students with disabilities. These programs offer students with specific needs the opportunity to interact with and learn about classroom content at the same time and at the same level as their peers. For example, for users with cognitive disabilities, classroom content can be modified to accommodate learning styles or specific focus areas. Also, access options for users with physical disabilities can range from auditory guides, vision accommodations, or options including switch and touch window accessibility.

Multimedia allows teachers to create original and customized projects for students with disabilities, and to highlight the strengths and needs of each individual student based on their specific situation.

Creating Multimedia Projects To Use With Students

“Talking the Talk”

Before creating any multimedia project, it is important to understand the “language” and definitions used in the multimedia process. For example:

- Sound includes recorded speech, music, sound effects, and computer-generated music, and other auditory elements.
- Images can include photographs, cartoons, clip art, or original drawings.
- Movies can be traditional films showing motion or a collection of still images played in sequence.
- Combinations of elements can also create new categories. An understanding of these terms is helpful when creating a multimedia project.

Planning

The first step in developing multimedia is planning. Have a clear vision of how the finished product should look. If the teacher is creating a multimedia project for his or her students; it should be designed with the student’s interaction in mind.

To make the design process easier, consider these steps:

1. Map out how to move through the program.
2. Organize and think about the content before beginning the project on the computer.
3. Gather the needed materials.

Step 1 – Navigation

Navigation is how the user moves through the program. The navigation is important both so the students comprehend the method and so that students with disabilities using assistive technology can have access to the program. Much like a Web site, multimedia may be designed in two ways:

- In a linear fashion (A to B to C),
- Or, a multi-layered, non-linear format (which allows users to move freely throughout the project).

For example, if the teacher is creating a storybook, the pages are presented in a linear order. Linear projects are best suited to topics following a natural

progression, such as the alphabet or the developmental stages in a plant’s life cycle. The design and use of linear projects can be a valuable tool to reinforce sequencing skills (how to put things in order). With simple, linear navigation and concepts, programs can be easily adapted for use with a switch or touch window, instead of a traditional mouse.

Non-linear navigation describes a project whereby the user can progress from one point to another in many different ways. Much like navigating the Internet, each turn opens up new options and different routes. The possibilities of non-linear design are endless, which makes this type of project rather complex. For example, in the linear alphabet scenario described above, users stepped through the alphabet in the order of the letters. In a non-linear model, the user can have a main page where they choose their own navigation based on any number of categories—letters, sounds, shapes, vowels versus consonants, etc. Each category leads the user to new pages containing additional links to more information, as well as basic links taking the user backwards or to the home page.

Access for non-linear projects must be considered on a greater scale. Depending on specific needs, switch scanning (making choices using a switch device) or guided navigation may be necessary to ensure universal design of the project.

TIP: When designing non-linear projects, it is very important to give users a variety of navigation options. Multimedia users may want to return to a previous activity, look at a new topic, or start over at any time. To ensure adequate navigational possibilities, it is important to map out all possible paths available to the user, taking into consideration all skill levels. The map will act as a guide. Maps can be designed with the help of software such as “Inspiration” or by using a paper and pencil. They may resemble an organization’s management chart or a family tree.

Step 2 – Organize the Content

When beginning a design, it is important to include both a table of contents and cues or prompts that tell the user that a particular section has been completed. Basic easy-to-understand information helps all “users, including those with disabilities. In the case of the non-linear alphabet program, a main navigation page—coupled with a final screen at the end of each

section—lets the user know when they have exhausted their options within that particular topic. Without an apparent structure or finish, users may not sense location, and the programs may seem endless.

Step 3 – Gathering Materials

Once a clear design is established, the next step is to collect supporting materials. Text should be saved to the computer with as little formatting as possible, because the specific multimedia software will apply additional formatting.

Images

Images are one of the strongest supporting elements in any multimedia project. Finding the right image to use depends on several factors—personal taste, the theme of the particular project, and any software restrictions.

There are many images available on the Internet. However, it is important to note that most Web images are copyrighted and not freely available to the public. As a general rule, if an image cannot be cited or permission is not explicitly given, the image cannot be considered “freely available.”

Another excellent source for images is clip art galleries. Clip art is mass-produced imagery specifically made for public use. Clip art is often free or very inexpensive and covers nearly every category imaginable. There are many sources for clip art on the Internet, most of which will charge a small fee. Microsoft Office comes with clip art images already installed and the option to download more images from their Web site as needed. Clip art CD-ROMs can also be purchased at virtually all computer retail stores and usually includes thousands of images at low cost.

The ideal way to obtain dynamic, free and legal images is to create your own. For cartoon or line-drawing images, drawing and painting programs are widely available and come with many features. Photographic imagery can be created using a digital camera or with a traditional camera and a scanner. Creating original images can save money and will enable teachers to customize each project. Children love seeing pictures of themselves or people they know.

TIP: To ensure accessibility for users who are visually impaired, describe the images either with a tag (available in some programs) or simple caption.

Sounds

Just as a movie sound track can greatly enhance the mood of a film, adding sounds to multimedia projects are a great way to make it engaging and accessible to the students. For example, sound effects relating to the imagery used (i.e. frogs croaking on the letter “F” page) can add an element of fun and keep students engaged in the content.

Sounds, like clip art, can be found online from a variety of sources. They are generally owned by individuals or corporations. These sounds are also protected by copyright laws.

Creating your own sounds can be done with a microphone and digital recording software. Most computers come with built-in microphones and free audio recording software, but high-quality audio equipment for professional quality projects can be expensive.

Alternative sources for audio content can include sound effect CDs and public-use sounds from the Internet. Audio CDs are generally inexpensive and available at many music stores, and searching the Web for legal sounds from reputable sources can yield an even greater variety of results for use in multimedia programs.

Video

Video can be another powerful way to enhance multimedia projects. To be effective, original video is best as short clips to keep the projects clear, effective, and a manageable size.

TIP: While designing and gathering supporting media, it is easy to lose sight of the original intent of the project. Children respond quite well to “less” than perfect multimedia if the content is solid and engaging.

Designing

What works best? Large target areas and clearly labeled links to each section of the project are extremely important. In addition to creating a sensible navigational design, it is important to make clear to the users where they can and cannot go within the program. This will help all users enjoy the project without frustration.

TIP: Simple interface areas will give users a clear idea of their options within the program—letting them know where they are at any given time and what they

are seeing. Even when a project allows for free exploration, some users will need a guide to lead them down the most logical path.

What does not work? Secret links, small buttons with no apparent purpose or excessive graphics confuse the user. These elements will cause the content to be lost in a tangle of animation, rollover buttons, and complex background images. Consider being trapped in a program with no apparent way to move forward or exit.

Accessibility

Accessibility means considering the goals of the curriculum and ensuring that all users have equal opportunity to achieve the goals. Universal design results from careful planning and consideration in the early stages of design. Examining how the information is presented will expose gaps in the project. For example, if important information is absolutely dependent on audio, designers can consider using captions or text to assist those students with hearing disabilities.

TIP: When creating programs for use with touch screens, consider large, easy-to-reach targets, rather than small images and icons suitable only for mouse users. In addition, switch users will benefit from simple interfaces that can be easily adapted for use with a scanning switch.

Many alternate access solutions are reached by modifying existing software programs. While every multimedia program may not necessarily reach all audiences, teachers can reach students with disabilities by planning ahead.

Sharing Multimedia With Others

How do you plan to use your multimedia project?

- Evaluate the audience. For a classroom presentation, the product will likely be displayed through a projector and navigated by the designer. In this case, the presenter must simply be sure that the presentation software is loaded into the appropriate hardware (computer) and that a projector and screen are available.
- An interactive multimedia project will likely be displayed at one or more computer stations and will be controlled by the audience. With this example, include the necessary player or viewing software to ensure usability in a variety of situations.

TIP: Most multimedia authoring software will have a free “player” application, which will allow the user to display, but not edit, multimedia programs on their computer. Check the original software documentation or product Web sites for more information on free player software.

TIP: Sharing the finished product with a larger, general audience can be a great way to provide students with the opportunity to build self-esteem, while showcasing their individual learning abilities and talents. Projects can be shared or displayed via Web sites, packaged products on CD (including any necessary player software in the package) or by inviting the school community members into the computer lab for a final project presentation day. Students will be proud to showcase what they can do, and will, in turn, enjoy a memorable learning experience.

Multimedia Tools

What program should you use? “Authoring” programs, which create multimedia, range from simple, easy-to-use applications, to powerful, expensive programs with nearly endless possibilities. Each of these tools offer different advantages and disadvantages depending upon the goal for the project.

Creating simple projects using the most powerful tool on the market will not only be difficult, but the learning curve on such programs is extensive.

When students are designing their own multimedia projects, teachers should select design software that is developmentally appropriate for their classroom—software that is manageable for the age group and ability of the students. If students must learn the software before starting the project, they may become frustrated and lose interest. Choosing the appropriate software will allow students to spend their time on the project, rather than on the process of learning new software.

TIP: Pay careful attention to the hardware requirements of any project. Many multimedia programs require powerful, modern computers in order to run properly. Technology coordinators will have hardware specifications for installed computers and can make specific software recommendations.

Multimedia Software

The following list includes several multimedia authoring titles suitable for use in a classroom. In addition to project descriptions, the list shows supported computer platforms, media types, and navigation options. The “ease of use” column displays whether or not each program is suitable for student-created projects, teacher tools, or both. This is not a comprehensive listing of all available programs, but rather a starting point to consider when deciding which software applications will work for you.

BuildAbility – Don Johnston ***(www.donjohnston.com)***

A linear multimedia tool, it is perfect for building early literacy skills in young children. BuildAbility is designed to be switch accessible, and uses Don Johnston’s “Drawmation” technology, which automatically allows users to see animated drawings in their projects. BuildAbility supports a few specific media formats and is intended for an early childhood/elementary audience.

HyperStudio – Knowledge Adventure ***(www.hyperstudio.com)***

One of the most widely used educational multimedia programs, HyperStudio allows users to design projects in a wide range of styles, sizes, and complexities. With HyperStudio, educators and students have the power to create almost any type of project, using a wide variety of media. HyperStudio accepts most methods (sound, images and video) and allows for a variety of navigation options. HyperStudio offers plenty of options at a competitive price, but creating more advanced projects can become too complex for some users.

IntelliPics Studio 3 – IntelliTools ***(www.intellitools.com)***

IntelliPics Studio 3 is the premiere multimedia design tool within the IntelliTools family of products. Massive in both its power and learning curve, IntelliPics Studio 3 offers the skilled designer the ability to create nearly any manner of presentation you can think of. Additionally, the ability to create interactive projects, such as digital coloring books and quizzes, makes IntelliPics Studio 3 one of the most versatile multimedia products available today. IntelliPics Studio 3 does require a significant amount of

learning to successfully create original projects. For experienced users, the end results are only limited by the creator’s imagination. IntelliPics Studio 3 is sold independently or as part of the IntelliTools Classroom Suite and offers a wide range of built-in accessibility features.

Microsoft PowerPoint – Microsoft Corporation ***(www.microsoft.com/office/powerpoint)***

Microsoft PowerPoint is a presentation tool that can be adapted for use with a single switch. PowerPoint is a standard piece of the Microsoft Office Suite and is easily adapted for digital books, multimedia presentations, or simple slideshow capabilities. PowerPoint is a very popular program and supports a wide range of media types. Power Point will support nearly any type of picture or sound.

My Own Bookshelf – SoftTouch Software ***(www.softtouch.com)***

My Own Bookshelf is designed to create accessible stories for students at all skill levels. My Own Bookshelf has several features that teachers find especially helpful for their students with disabilities. Teachers can create books using digital images, sounds, and movies very quickly, and they can organize books into bookshelves for students to access. Students can access books on their bookshelves via mouse, switch, touch window, and IntelliKeys keyboard. My Own Bookshelf offers limited design features, but it is extremely easy to use and very popular among early childhood and special education teachers.

Software Title	Platform	Supported Media			Ease of Design	Navigation Options	Free Player
		Video	Image	Audio			
BuildAbility	Mac/Win	MPG	PICT BMP	WAV AIFF	Both	Linear	Yes
HyperStudio	Mac/Win	MPG	PIC TIF JPG PCX BMP GIF PSD TGA WMF	WAV AIF SND AIFF MID	Both	Both	Yes
IntelliPics Studio 3	Mac/Win	MPG	PICT GIF JPG DIB PNG BMP WMF	WAV AIF MP3 SND	Teacher	Both	Yes
PowerPoint	Mac/Win	MPG	EMF GIF JPG PNG BMP TIFF WMF	WAV MP3 MID	Teacher/ Both	Both	Yes
My Own Bookshelf	Mac/Win	MOV AVI	GIF JPG BMP	WAV AIFF AU	Both	Linear	Yes