



Chapter Two: Hypermedia and Multimedia

The printed page has reigned supreme as the medium of choice for academic publishing for several centuries. Traditionally, a dissertation or thesis was typed, printed, bound, and stored on the researcher's university library shelf. As the technology for photography developed, the text of the document was preserved on microfilm in a central scholarly publication database. That research text was made available to fellow researchers and university scholars upon request. As personal computers became more accessible, word processing software was used to type the document and the text was saved digitally on floppy disk. As standardized cross-platform publishing formats were developed, the concept of digital libraries became a real possibility. With the development of Hyper Text Markup Language (HTML), a student author could incorporate multimedia elements: sound, graphics, video, animation, and interactivity.

The digital revolution of the late 20th century stimulated dramatic change in the potential for libraries and universities to store and distribute data. McClintock (1999) compared the print culture traditionally supported in education with the possibilities of digital learning communities in "The Educators Manifesto." He described new possibilities as a result of high-speed wide-area networks, linking people through ubiquitous computers to copious digital libraries, transforming the cultural conditions under which educational interactions take place." McClintock stated that, historically, the technologies of printing were of extraordinary importance in helping educators as they formed and spread ideas and ideals. However, he believed that "digital libraries, multimedia, and augmented skills have changed the limits of educational practice" (1999).

In addition, McClintock believed that ways of knowing are greatly expanded because of the "new media." He stated that "multimedia, and its extension in virtual reality, is not merely a glitzy vehicle for edutainment hype. It is an epistemologically interesting development in our culture." McClintock discussed the fact that the work of thinking has been related to "how people manipulate their spoken and written languages." He believed that multimedia allowed thinking to take place through many forms: "verbal, visual, auditory, kinetic, and blends of all and each." He stated that the new media was becoming more suitable for "serious intellectual work" (1999).

In his paper concerning the shift from "flatland to the e-document," Hinman (1999) stated that the "paradigm for authoring is changing." He claimed that the paper is one-dimensional, black-and-white, static, and flat in comparison to the dynamic multidimensional, interactive, rich-in-multimedia world. Hinman discussed the concept of "authoring" in comparison to "merely putting words on paper." He stated that multimedia authoring required new skills and access to new multimedia materials:

graphics, sounds, audio, and video. Hinman discussed the fact that multimedia contains branching and loop-back possibilities and allows for varied and adjustable durations and sequences of events. Giving the reader (or viewer) choices in a branching or web-like presentation further has challenged the traditional structure of the thesis or dissertation. The sequential linear flow of the text, as well as the typical chapter format expected in scholarly writing, may not be evident, nor considered crucial to a new media presentation of the data. (<http://www1.chapman.edu/soe/faculty/piper/casestudy.htm>)

Why use Multimedia?

"The combination of creativity and complexity required to author hypermedia in a form that is intrinsically motivating to students (multimedia) makes it probably the most compelling and potentially effective of all Mindtools. The richness of representational forms available in multimedia knowledge bases is greater than in all other Mindtools. Future research will very probably documents the effects of designing with multimedia, rather than learning from it."

by David Jonassen - School of Information Science and Learning Technologies of University of Missouri (<http://it.coe.uga.edu/itforum/paper1/paper1.html>)

Technology as Cognitive Tools - Learners as Designers

Electronic portfolios provide teachers with an opportunity to engage the student more completely in the process of self assessment. Selecting evidence of achievement in the multi-dimensional format of multimedia goes beyond the "flat" page of a written document or a percentile ranking on a standardized test. Involving students in the creative process of developing their electronic portfolios will result in what has been called "mindful" engagement. Jonassen (<http://tiger.coe.missouri.edu/~jonassen/>) has written extensively on the use of technology in constructivist learning environments. He discusses "mind tools" and what he calls "learners as designers" in his position paper on technology as cognitive tools. He states that "the people who learn the most from the design and development of instructional materials are the designers." When students try to represent what they know, they demonstrate critical thinking skills. The students are "learner-controlled" rather than teacher or technology-driven. Jonassen refers to this as knowledge construction, not reproduction. He believes that the computer can enhance student thinking and learning if students are involved in the planning, decision-making, and self-regulation. He discusses the importance of reflective thought in the process of problem solving with technology. He states: "Computers may also function as cognitive technologies for amplifying and reorganizing the way that learners think. When learners use computers as partners, they off-load some of the unproductive memorizing tasks to the computer, allowing the learner to think more productively."



Papert writes: *"In many schools today, the phrase 'computer-aided instruction' means making the computer teach the child. One might say the computer is being used to program the child. In my vision, the child programs the computer ..."*
That is what the Turtle project is about. In hypermedia the child is more free in its relation to the computer. It is not like the child is programmed by the computer. When a child learns e.g. maths by a linear computer-program it is much like that the child is programmed by the computer. But that is not the case with hypermedia."

Seymour Papert - Creator of Logo -
"Programming the child or the child
programming" from:

www.mc.hik.se/~mia96luj/hypermedia/hyper2.html (Site no longer available)



What is multimedia? What is the role of the teacher? What are the advantages?

Mind Tools Resources

JoAnne Davies (1997) of the University of Alberta provides a useful website on Technology in Education, including additional materials on Jonassen's Mind Tools - <http://www.quasar.ualberta.ca/edpy485/edtech/index.htm>. She describes multimedia is the integration of media such as text, graphics, animation, sound, and video. Hypertext is a nonsequential, nonlinear method for displaying text. It allows for links between nodes or chunks of information. The organizational structure is a network of ideas accessible by many different users. Hypermedia is the union of multimedia and hypertext. For students, the advantage in using hypermedia is that they are more mentally engaged by developing materials rather than studying them and they are more motivated since they have ownership in the product.

- The learner is more mentally engaged by developing materials than studying them
- Permits concrete representation of abstract ideas
- Enables multiple representations of ideas
- Students are actively engaged in creating representations of their own understanding by using their own modes of expression
- Students are highly motivated due to pride of ownership in the product

- Orients teachers and students away from "knowledge is information" and "teacher's role is to transmit knowledge."
- Promotes development of critical theories of knowledge

Davies provides a list of thinking skills developed by by students when developing a hypermedia presentation.

- Project Management Skills: create timeline, allocate resources, assign roles
- Research Skills: determine problem, organize the research, search for information, develop new information, analyze and interpret information
- Organization and Representation Skills: segment and sequence information, decide how to represent it
- Presentation Skills: implement ideas in multimedia, maintain audience interest
- Reflection Skills: evaluate the process / product, revise using feedback

The role of the teacher is less directive, prompting and provoking students with questions, and coaching the student in planning and processing. The processes the student goes through when developing hypermedia includes the following:

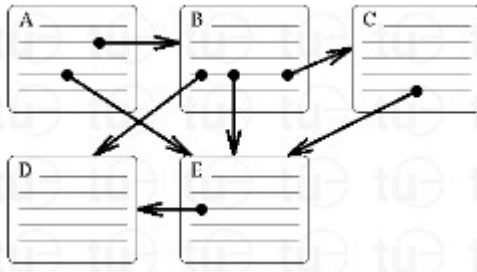
- Planning: goal, content, interface design, collaboration
- Transform information into knowledge: search, select, interpret, allocate to nodes, decide on medium, create links
- Evaluate the knowledge base: assess, information coverage, test browser, solicit feedback
- Revise the knowledge according to feedback: correct content errors, reorganize and restructure to make the knowledge more accessible or meaningful.

Davies, J. (1997) - <http://www.quasar.ualberta.ca/edpy485/mmedia/index.htm>

Hypermedia and Multimedia have become more important today because of the World Wide Web.

- The World Wide Web
- Powerpoint
- Hyperstudio
- Online Course Designers
- Other Authoring Programs - Flash, Macromedia, Authorware, Viewlets, etc.
- Online Books - Hypertext
- Online Publishing

HYPertext



- Example of set of hypertext documents
- Same principles of instructional design apply
- Connections are made demonstrating interrelationship of various documents
- Basis of the World Wide Web and Hypermedia
- Makes traditional linear document seem "flat" in comparison.
- Can be very confusing to people who prefer the linear step-by-step approach to learning. (I feel this is why some people do not care for the web. They may prefer a more logical time sequence based on beginning at one point and moving through to the end and may be distracted with hyperlinks that take them off in too many different directions).

Are there school districts that promote the use of hypermedia with students?

The Ellensburg District in Washington State ("Wonders") provides "A Guide to Multimedia in Education"

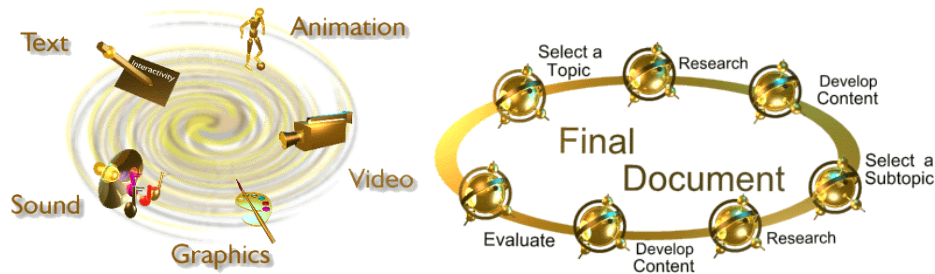
(<http://wonders.eburg.wednet.edu/Topics/GMMIE/default.htm>). Although this website is aimed at web multimedia, the same elements are a part of Hyperstudio and Powerpoint. The Grand Tour on this website discusses five types of media: text, animation, sound, graphics, and video. This site provides an overall introduction into the changes that are taking place in education with the emphasis on production, rather than consumption.

(<http://wonders.eburg.wednet.edu/Topics/GMMIE/issuesEd.htm>). The "Trip through the History (and Curriculum) of Microcomputer Madness"

(<http://wonders.eburg.wednet.edu/Topics/GMMIE/shortHist1.htm>) takes you from the 70's "golden age of no" through the 80's "promises unfulfilled." The late 80's are described as "consumption to production" and the 90's as the "information flow." The author defines today as "information flow in both directions." In other words, we (and out students) can find interactive information as we research, but we can also

produce interactive information as we publish. When you get to the end of that page - click on play with it, adding the lines to view the interconnectivity in the graphic.

"Consumption is by far the easiest route to take. With the proper computer and a small collection of CD-ROMs you can be on your way. Add to that a connection to the Internet and it may appear that magic is happening. Ready-made multimedia can be used to augment almost any area of the curriculum. It simply adds one more source to a reference library; it is one more tool in the kit. All of the multimedia formats available: text, sound, video, animation and graphics, already exist in one form or another in most libraries. A well written multimedia title simply allows more student control over the content they are viewing. Students can explore an almost infinite variety of information. All these explorations can certainly lead to new discoveries, but unless consumption is followed by production, the story ends. Without a chance to use their new discoveries and demonstrate what they have learned, the knowledge gained soon becomes the knowledge forgotten. Yet to be truly effective, production methods must change."



Non-Linear Production Model

I have included a discussion of Hyperstudio software because of my experience with my Title I students. These students were often unmotivated to work in a traditional teacher-centered classroom environment. Allowing students to create Hyperstudio stacks on curriculum topics aligned with frameworks and standards resulted in a student-centered and engaging learning environment. Project-based learning motivated students to be very creative as they explored, tapped into their prior knowledge, developed new knowledge and skills, solved problems, and collaborated with their peers. Students put hours into their projects, laboriously perfecting every word, graphic, link, and multimedia effect. Their final products were a source of pride for them and their parents.



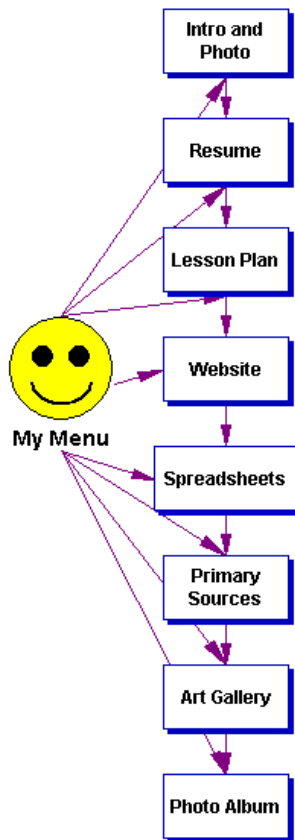
Professor's Note

We documented all projects, along with live video-taping and Powerpoint presentations, on a VHS tape as a video portfolio that they were able to take home at the end of the year. On a personal note: I feel that these students would not have achieved as well as they did in the skill/drill remediation approach currently so popular. In tracking test scores, the majority of my Title I students were no longer in Title I since their test scores had risen above the 25% and below requirement for eligibility. Several Title I students actually tested as gifted in the following year. Of course, to be fair in my analysis, most of the students were English Language Learners. Thus - their language skills were improving at a rapid rate due to many interventions beyond Title one, as well as becoming more comfortable with the language.

Common Applications for Creating Electronic Portfolios

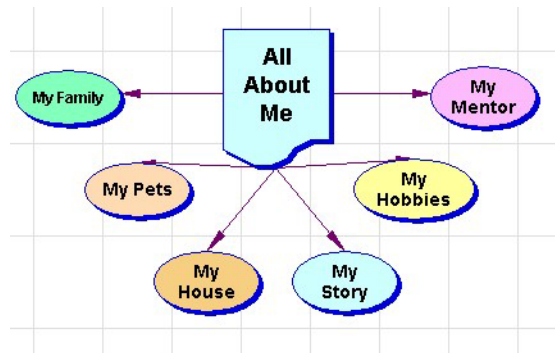
- Hyperstudio
- Powerpoint
- Web Authoring

Electronic portfolios can be created using a variety of software applications. Although this book will focus on the use of Powerpoint, Hyperstudio is another effective way to create student portfolios. With the ease of web authoring, creating website portfolios has become very popular as well. Your first step will be to determine how you want your portfolio organized. What is the purpose of your portfolio assessment? You may wish to start with a graphic organizer. The technology portfolio examples below are made in Inspiration. The Hyperstudio menu for the technology portfolio has buttons that link to a card or stack from the index page.



My Menu in Inspiration

Creating Your Technology Portfolio with Hyperstudio



Example of a Hyperstudio Portfolio Menu



Hyperstudio

Hyperstudio Web Resources - <http://www.hyperstudio.com>

Hyperstudio is another program that I recommend as a great multimedia authoring software for students. It is particularly useful in terms of literacy because you can include text boxes with almost unlimited space for typing and importing from a word processor. I am not requiring that you purchase this program, but student pricing is available. See the Hyperstudio tutorial in the Unit Six course documents folder for more information. Sunburst Knowledge Adventure refers to Hyperstudio as "a powerful multimedia tool that increases student achievement." The advantages of Hyperstudio include improved problem-solving and creative thinking skills, appeal to a wide variety of student interests and learning styles, and reinforcement of student development in project-based education. Hyperstudio can help teacher meeting ISTE's National Education Standards for developing the following skills and concepts:

- Develop creative problem-solving and critical-thinking skills
- Learn to collaborate and develop team-building skills
- Research, organize, and present information
- Use of technology and productivity tools
- Communicate effectively
- Develop visualization skills

Powerpoint vs. Hypertstudio

Many of the features will resemble Powerpoint. However, there are some aspects of Hyperstudio that make it a better application for student generated projects, particularly in terms of interactivity, options for text, and the built-in paint program for graphics. Powerpoint is more effective for presentation, but Hyperstudio has the potential for allowing students to design and author their own interactive multimedia software. These projects can become very complex, especially when students begin to add large amounts of text, link many stacks to a main menu, link to other programs, and add video and animation. The hyperlogo options allow advanced computer users to add sophisticated elements to their Hyperstudio stacks. Hyperstudio can also be useful for the teacher in terms of instructional design. Typically, Powerpoint is used for a linear presentation of information, but many of the software tools function much like Hyperstudio. You have the potential for hyper-linking, using interactive buttons, creating navigational menus, and insert graphics,

audio, video, and web links. Both programs come with "players" that are free downloads so that the user does not need to purchase the full program.

Powerpoint

- Presentation Application
- Final Product - Presentation
- Create Slides
- Interactive Buttons
- Some Graphics Tools - No Graphics Editor
- Business Oriented Clipart
- Multimedia Audio and Video
- Text - Keywords, Outlines, Bullets Perfect for Presenting Key Points but Not for Large Amounts of Text
- Linear, Branching, and Circular - but Typically Used as a Linear Presentation
- Presentations can be linked to other presentations and programs, as well as websites.
- Animations Available, but Limited to Built-In Program Effects.

Hyperstudio

- Authoring Application
- Final Product - Stack
- Create Cards
- Interactive Buttons
- Paint Options for Editing Built-in - can Paint/Draw/etc.
- Education Oriented Clipart Library
- Multimedia Audio and Video
- Text - Options for Pasting Large Amounts of Text in Scrollable Boxes for Journals
- Linear, Branching, Circular Designs, but Particularly Useful for Branching Designs
- Stacks can be linked to other stacks and other programs, as well as websites.
- Animations Can be Customized with Original Art, Pathways, etc.

Creating a Portfolio in Powerpoint

The following screenshots show a technology portfolio template for teachers. Powerpoint allows the user to select a presentation design that automatically generates a background theme. The user can also create his/her own background with fills, pictures, textures, etc. The second screen provides an interactive menu with each button linking to another slide. Navigational buttons allow the user to go to the next slide, the previous slide, or the home page menu from each other slide. You can create buttons that link to another Powerpoint presentation, another document or spreadsheet, an Acrobat Reader pdf file, or another program application. Your page layout will depend on whether you are bringing in text, graphics, tables, or charts. See the Powerpoint tutorial for more detailed instructions.

My Technology Portfolio



My Name:
**EDUC9045B:
 Teaching with
 Technology, Level II**

Menu

Resume

Primary Sources

Lesson Plans

Spreadsheets

Rubric


Artwork

Graphic Organizer

Photo Album

Primary Source Lesson Plan

"It may be true that the law cannot make a man love me, but it can keep him from hating me, and I think that's pretty important."



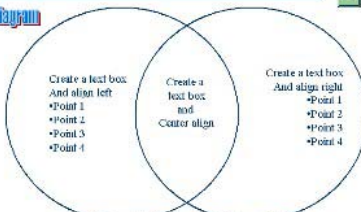
Go to Primary Source Lesson Plan Presentation

- Standards
 - Standard #1
 - Standard #2
 - Standard #3
- Tasks and Activities
 - Step One
 - Step Two
 - Step Three
 - Step Four
 - Step Five
- Assessment

Rubric

	Exceptional	Good	Adequate	Poor
Mechanics				
Organization				
Content				
Creativity				

Graphic Organizer



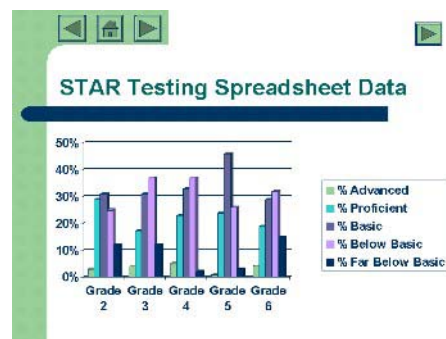
Create a text box
And align left

- Point 1
- Point 2
- Point 3
- Point 4

Create a text box
and
Center align

Create a text box
And align right

- Point 1
- Point 2
- Point 3
- Point 4



The example below is a multimedia curriculum presentation with an interactive menu using Powerpoint. Rather than creating a linear slide by slide Powerpoint, try creating a menu with links to slides. Each button will link directly to the different slide topics. You can also create navigation buttons in the autosshapes menu. These are called action buttons and you edit those from the slide show menu. A student might create a multimedia project Powerpoint presentation which can be linked to the portfolio index.