Electronic Portfolios: The State of the Art

Northwest Council for Computer Education
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Web Site on Electronic Portfolios
Listserv: el-port@uaa.alaska.edu
http://transition.alaska.edu/www/portfolios.html
E-mail: afhcb@uaa.alaska.edu
Objectives: Participants will:

- Become aware of the questions to ask when planning to implement electronic portfolios for students and teachers
- Become aware of the various strategies for authoring electronic student & teacher portfolios
  - Authoring Software
  - Equipment
  - Process
Electronic Portfolios
Cross the Age Span

- Early Childhood
  (with Parent/Grandparent Involvement)
- Elementary School
- Secondary School
- Teacher Education
- Professional Portfolios
I. Why Electronic Portfolios for Educators Today?

1. What is a portfolio?
   *Why is it a critical tool in today’s standards age?*

2. What is an electronic portfolio?
   *How can it be a learning tool in today’s information age?*

3. What is your purpose for developing a portfolio?
   *What is the role of electronic portfolios in today's standards age?*
   *Strategic questions, basic decisions, portfolio context.*
II. Developmental Contexts for Electronic Portfolios

4. The Young Child and Family Portfolio
   “Beyond the Baby Book” - Birth through 3rd Grade
   Case Studies: Video tape & parent involvement

5. The Middle Level Student Portfolio
   “Beyond the Report Card & Cum Files” - 4th–8th Grade
   Case Studies: Hypermedia programs & propriety software

6. The Adolescent Student Portfolio
   Beyond GPA and SATs” - High School
   Case Studies: Multimedia authoring software & relational database

7. The College Student Portfolio
   “Beyond Transcripts”
   Case Study: HTML & Web-based portfolios

8. Professional Portfolios
   “Beyond Resumes and Vitas”
   Case Study: Adobe Acrobat PDFs & CD-ROM-based portfolios
III. Tools and Strategies for Constructing Electronic Portfolios

9. Multimedia Technology: Tools and Strategies for Learning How to Learn


11. Digitizing Images and Graphics

12. Digitizing Sound

13. Digitizing and Using Video

14. Scanning Text

15. Mixed Media Products

16. Organizing Electronic Portfolio Artifacts for Easy Storage & Retrieval to meet your purpose

17. Decision Time: Using Strategic Questions to Choose Best Options
What is a portfolio?

- a purposeful collection of student work that demonstrates effort, progress and achievement (hopefully, based on a set of standards)
- provides a richer picture of student performance than can be gained from more traditional, objective forms of assessment
- traditional standards-based portfolios are 3-ring notebooks, organized with dividers and sections for documents demonstrating each standard

(Campbell, et.al., 1997)
What is an Electronic Portfolio?

- uses electronic technologies
- allows students/teachers to collect and organize portfolio artifacts in many media types (audio, video, graphics, text)
- uses hypertext links to organize the material
- connects evidence to appropriate standards
Electronic or Digital Portfolio?

- An Electronic Portfolio contains artifacts that may be in analog form, such as a video tape, or may be in computer-readable (digital) form.

- A Digital Portfolio contains artifacts that have been transformed into computer-readable form (digitized/scanned/input).
Types of Portfolios

- **Working Portfolios**
  - an intentional collection of work guided by learning objectives

- **Display, Showcase, or Best Works Portfolios**
  - demonstrate the highest level of achievement
  - a celebration of learning

- **Assessment Portfolios**
  - to document student learning on specific curriculum outcomes
Is it a portfolio?

Or is it an electronically stored collection of student work?
Feature
Strategic Questions
What to Consider When Planning for Electronic Portfolios

Assessing a student’s development over time is always a challenge, especially when the student’s earlier work is not readily available. In this feature article, the author discusses how one alternative assessment form, the electronic portfolio, can help teachers track student improvements over long periods. She also presents the most important questions that educators must answer as they consider using such assessments.

By Helen C. Barrett (L&Lw/T, October, 1998)
What Should a Traditional or Electronic Portfolio Include?

A portfolio should include the following elements:
• learner goals
• guidelines for selecting materials (to keep the collection from growing haphazardly)
• work samples chosen by both student and teacher (the "artifacts")
• teacher feedback
• student self-reflection pieces
• clear and appropriate criteria for evaluating work (rubrics based on standards)
• standards and examples of good work
Why use technology?
Sheingold’s Reasons (1992)

- To make work in many media accessible, portable, examinable, widely distributable
- To make performance replayable and reviewable; it is important to see more than once
- To address ownership issues of student-created work
- To address storage issues
Why use technology? (Barrett’s assumptions, 1998)

- Today, many documents are initially created with a computer, anyway.
- Hypertext links allow clear connections between standards and portfolio artifacts.
- Creating an EP can develop teachers’ skills in using multimedia technology.
- Modeling: A teacher with an EP will be more likely to have students with EPs.
- It’s fun & easier to manage the process, especially storage, presentation, and duplication.
<table>
<thead>
<tr>
<th>Teacher-Centered</th>
<th>Mixed Model</th>
<th>Learner-Centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers take full responsibility for all aspects of the electronic portfolio</td>
<td>Where appropriate, teachers share responsibility with students, who lead</td>
<td>Students are completely in charge of their own portfolios, including digitizing</td>
</tr>
<tr>
<td>process; may have parent volunteers to help.</td>
<td>their own parent conferences. Students collect most of the artifacts and</td>
<td>work samples, storage, and presentation.</td>
</tr>
<tr>
<td></td>
<td>digitize some of the work.</td>
<td></td>
</tr>
<tr>
<td><strong>Self-assessment:</strong></td>
<td><strong>Self-assessment:</strong></td>
<td><strong>Self-assessment:</strong></td>
</tr>
<tr>
<td>Little or no student self-assessment or peer or parent involvement in assessment.</td>
<td>Collaboration in self-assessment is encouraged.</td>
<td>Students are responsible for assessing their own work, often in collaboration</td>
</tr>
<tr>
<td></td>
<td></td>
<td>with peers, parents, teachers, and others.</td>
</tr>
</tbody>
</table>
1. What is the purpose of the portfolio?

The portfolio’s purpose and varied audiences will determine many of the following context factors. These factors relate not only to the purpose of the portfolio, but also to other learner characteristics. We assume that different ages and audiences will lead to different portfolios and purposes and thus different formats for storage and publication.

UCLA’s National Center for Research on Evaluation, Standards, and Student Testing (CRESST) identified a preliminary list of various assessment purposes that it used for classification in a database on alternative assessment strategies. Information from the list has been distilled into Table 2, which shows each type of assessment and its potential primary audience.
2. How will you store the working portfolio?

The working portfolio is distinct from the formal one. It serves to store all artifacts of student work as they are collected. The medium selected thus should allow both easy access and reliable storage. Examples include computer disks (floppies or hard drives), scannable paper, rewritable compact discs (CD-RWs), videotape, high-density disks (e.g., Zip or Jaz disks), and intranet (building or district) or password-protected servers.
3. How will you publish the formal portfolio?

Once portfolio artifacts are collected and organized, a formal or presentation portfolio is developed. This usually requires a different publishing format or medium.

Decisions here should be based on the portfolio’s primary audience and the type of technology available. Examples include CD-ROMs, videotape, intranet (building or district) or password-protected servers, and the Internet (in appropriate circumstances).
4. How will you guarantee secure assessment information?

In other words, how can you make sure that the electronically stored student assessment information will remain secure and confidential?

5. Can you use technology to collect observational assessment data?

If so, only two programs—Learner Profile and Grady Profile—are commercially available, and only Grady is capable of storing portfolio items.
Other Assessment Context Factors

A few other important questions also need to be answered.

- What is the student’s age?
- What time frame will the portfolio cover?
- What kinds of outcomes will be assessed?
- What is the focus and type of evidence being collected?
- What multimedia formats must be included to illustrate student efforts, progress, and achievement?
- Do you want to correlate student performance to state or district standards—that is, document the achievement of specific standards by linking them to specific evidence such as artifacts, exhibitions, or performances?
### Resource Questions

1. **What is the stakeholder’s experience using traditional portfolio-based assessment?**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>Limited experience in storing samples of student work in file folders</td>
<td>Regularly uses portfolios as teacher-centered assessment tool</td>
<td>Students and teachers collaboratively select items to go into student’s portfolio, using well-defined rubrics to evaluate student work</td>
<td>Level 3 and portfolios incorporate standards (national, state or district) and stakeholders have access to exemplars for comparison</td>
<td>Level 4 and maintains student-centered assessment environment, including student-led conferences</td>
</tr>
</tbody>
</table>
2. At what level are the teachers’ computer skills?

<table>
<thead>
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</thead>
<tbody>
<tr>
<td><strong>Limited experience with desktop computers but able to use mouse and menus and run simple programs</strong></td>
<td><strong>Level 1 and proficient with a word processor, basic e-mail, and Internet browsing; can enter data into a predesigned database</strong></td>
<td><strong>Level 2 and able to build a simple hypertext (nonlinear) document with links using a hypermedia program such as HyperStudio or Adobe Acrobat Exchange or an HTML WYSIWYG editor</strong></td>
<td><strong>Level 3 and able to record sounds, scan images, output computer screens to a VCR, and design an original database</strong></td>
<td><strong>Level 4 and multimedia programming or HTML authoring; can also create QuickTime movies live or from tape; able to program a relational database</strong></td>
</tr>
</tbody>
</table>
3. What is the level of student access to computers?

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Little or no access during a typical week</td>
<td>Access to a computer for at least two hours a week; 20:1 student-to-computer ratio</td>
<td>Access to a computer for at least half an hour a day; 15:1 student-to-computer ratio</td>
<td>Access to a computer for at least one hour a day; 10:1 student-to-computer ratio</td>
<td>Access to a computer for at least two hours a day; 5:1 student-to-computer ratio</td>
</tr>
</tbody>
</table>
4. What is the students’ level of technology competence and independence in using a computer? (Is it age-dependent?)

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Limited experience with desktop computers but able to use mouse and menus, and run simple programs</td>
</tr>
<tr>
<td>2</td>
<td>Level 1 and proficient with a word processor, basic e-mail, and Internet browsing; can enter data into a predesigned database</td>
</tr>
<tr>
<td>3</td>
<td>Level 2 and able to build a simple hypertext (nonlinear) document with links using a hypermedia program such as HyperStudio or Adobe Acrobat Exchange or an HTML WYSIWYG editor</td>
</tr>
<tr>
<td>4</td>
<td>Level 3 and able to record sounds, scan images, output computer screens to a VCR, and design an original database</td>
</tr>
<tr>
<td>5</td>
<td>Level 4 and multimedia programming or HTML authoring; can also create QuickTime movies live or from tape; able to program a relational database</td>
</tr>
</tbody>
</table>
5. What technology is already available in the classroom? Describe computers, including RAM and hard-drive storage capacity, and every 18 months look for the minimum technology capability to double and costs to decrease by half for the same power and capacity.

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<tr>
<th>Level</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>No computer</td>
</tr>
<tr>
<td>2</td>
<td>Single computer with 8 MB RAM, 80 MB HD, no AV input/output</td>
</tr>
<tr>
<td>3</td>
<td>One or two computers with 16 MB RAM, 250+ MB HD, simple AV input (such as QuickCam)</td>
</tr>
<tr>
<td>4</td>
<td>Three or four computers, one of which has 32+ MB RAM, 500+ MB HD, AV input and output, scanner, VCR, video camera, high-density floppy (such as a Zip drive)</td>
</tr>
<tr>
<td>5</td>
<td>Level 4 and CD-ROM recorder, at least two computers with 64+ MB RAM; digital video editing hardware and software. Extra Gb+ storage (such as Jaz drive)</td>
</tr>
</tbody>
</table>
6. What type of networking is available in a classroom, building, or district? Is there a server?

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<th></th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No network, only stand-alone systems</td>
<td>Printer sharing and file sharing only via network</td>
<td>Dial-up PPP access to network through 28.8 modem</td>
<td>Ethernet network with 56K access to district server</td>
<td>Full TCP/IP (Internet access at T-1 or Ethernet speed); WWW server in building</td>
</tr>
</tbody>
</table>
### 7. How much budget is available for additional hardware and software?

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<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>$300 per classroom</td>
<td>$600 per classroom</td>
<td>$2,000 per classroom</td>
<td>$5,000+ per classroom</td>
<td></td>
</tr>
</tbody>
</table>
8. How much budget is available for staff development (time and cost) and support?

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<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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</thead>
<tbody>
<tr>
<td>None</td>
<td>After-school workshop or credit class on own time (or both)</td>
<td>Inservice days dedicated to implementation</td>
<td>Release time for teachers to visit other classrooms</td>
<td>Release time and in-class support</td>
</tr>
</tbody>
</table>
Which Supporting Technologies Will Manage the Digitizing Process?

Authoring Software

Most people know how to store work in paper files and folders but not how to organize information electronically on a computer for easy storage and retrieval. A good authoring program helps students construct and organize their portfolios and presentations. Tables 3 and 4 list different software alternatives, using either generic authoring software or commercial software that has been developed specifically for electronic portfolios.

See Table 3 and Table 4
Hardware Add-Ons

Many people are learning how to use desktop computers for both professional and personal productivity. They may not know, however, the types of additional equipment that will enable multimedia production for presentations and portfolios. Fortunately, the addition of three inexpensive items to a desktop computer can produce a highly effective electronic-portfolio development station:

• a $99 “eyeball” video camera
• a page scanner (less than $150)
• a high-density floppy drive (such as a Zip drive; less than $150).
Multimedia Presentations and Electronic Portfolios: A Comparison

Assessment purpose and context are what determine the difference between constructing multimedia presentations and creating electronic portfolios with multimedia elements. Many of the hands-on technology skills are the same.

Table 5 compares the two using the Decide, Design, Develop, and Evaluate (DDD-E) multimedia instructional design model. In both scenarios, the sequence of activities is not be as linear as shown in Table 5, but more iterative, based on an ongoing formative evaluation process.

See Table 5
What are the phases of Portfolio Development?

- Collection
- Selection
- Reflection
- Projection

- Decide
- Design
- Develop
- Evaluate

From traditional portfolio literature (ASCD, 1997)

From multimedia development literature
Decide:

- goals of portfolio based on learner outcome goals that should be based on national/state/local standards with associated evaluation rubrics
- describe the assessment context
- describe the audience(s) for the portfolio (student, parent, college, community?)
- content of portfolio items (determined by context)
Elements of Portfolio Planning

- Purpose
- Audience
- Process
A few words about the primary audience for the portfolio

- If you focus on electronic portfolios for employment AND the primary audience (principals) doesn't look at it, then students become frustrated.

- If you focus on electronic portfolios for evidence of professional development, AND the primary audience (the student & faculty) uses the portfolio to validate that growth, then students become empowered.
Why use Standards in Portfolios?

“Standards come alive when they are assessed through performance-based means such as portfolios.”

New Systems Needed

- As we move to more high stakes performance assessments for high school graduation, it will become more critical to have a flexible recordkeeping system that can track these demonstrations of competency in a variety of multimedia formats.
No links to standards

- Too many of the current examples of electronic portfolios, both “classroom-grown” and commercial, focus on the glitz and glamour of high tech multimedia; very few commercial programs provide the capability of directly linking students’ digital portfolio artifacts to the standards for which they demonstrate achievement.
The very definition of a portfolio implies a purpose, tied to progress and achievement...but of what? I propose that we need to begin focusing our attention less on the “electronic” and more on the “portfolio” -- the standards that our students need to demonstrate.
Without standards as the organizing basis for a portfolio, the collection becomes just that...a collection, haphazard and without structure; the purpose is lost in the noise, glitz and hype.
Design

• Determine which software tools are most appropriate for the portfolio context

• Determine which storage and presentation medium is most appropriate for the situation

• Storyboard the portfolio
What is the best electronic portfolio program?

- It depends!
  - on the assessment context
  - and a variety of other factors, human and technological, that exist in a classroom, school or district.
Authoring software

There are a variety of authoring software packages which allow the creation of

hypertext links

between goals, student work samples in multiple forms of media, rubrics, and assessment.
Importance of Using Appropriate Software

The software used to create the electronic portfolio will control, restrict, or enhance the portfolio development process.

Form should follow function, and the electronic portfolio software selected should match the vision, style and skills of the portfolio developer, as well as the technology available.
How do you decide what tools to use?

- Level of Teacher Skill (Relative Ease of Use)
- Level of Technology Required
- Other factors

(Learning & Leading with Technology, October, 1998)
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<tr>
<th></th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Limited experience with desktop</td>
<td>Level 1 PLUS proficiency with a word</td>
<td>Level 2 PLUS able to build a simple</td>
<td>Level 3 PLUS able to record sounds, scan</td>
<td>Level 4 PLUS multimedia programming</td>
</tr>
<tr>
<td></td>
<td>computer - able to use mouse, menus,</td>
<td>processor, basic e-mail and Internet</td>
<td>hypertext (non-linear) document with</td>
<td>images, output computer screens to a</td>
<td>or HTML authoring; create QuickTime</td>
</tr>
<tr>
<td></td>
<td>run simple programs</td>
<td>browsing; enter data into a pre-</td>
<td>hypertext links (using either a</td>
<td>VCR; design an original database</td>
<td>movies live or from tape; program a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>designed database</td>
<td>hypermedia program like HyperStudio,</td>
<td></td>
<td>relational database</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Adobe Acrobat Exchange, or an HTML</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>WYSIWYG editor)</td>
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<td></td>
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</tbody>
</table>
# Level of Technology Required

<table>
<thead>
<tr>
<th>Level</th>
<th>Technology Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No computer</td>
</tr>
<tr>
<td>2</td>
<td>A single computer with 8 MB RAM, 80 MB HD, no AV input/output</td>
</tr>
<tr>
<td>3</td>
<td>One or two computers with 16 MB RAM, 250+ MB HD, simple AV input (like QuickCam)</td>
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<tr>
<td>4</td>
<td>Three or four computers, one of which has 32+ MB RAM, 500+ MB HD, AV input and output, scanner, VCR, video camera, high-density storage device (such as Zip drive)</td>
</tr>
<tr>
<td>5</td>
<td>Level 4 PLUS CD-Recorder, at least two computers with 48+ MB RAM Optional: video editing hardware and software</td>
</tr>
</tbody>
</table>
# Comparison of Construction Tools

<table>
<thead>
<tr>
<th></th>
<th>Relational data base</th>
<th>Hypermedia “card” file (including templates)</th>
<th>Multimedia authoring software</th>
<th>WWW Pages</th>
<th>Acrobat Reader</th>
<th>Proprietary software</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common development tools</strong></td>
<td>FileMaker Pro</td>
<td>HyperStudio Digital Chisel</td>
<td>Macromedia Authorware, Director</td>
<td>Adobe PageMill, Claris HomePage</td>
<td>Adobe Acrobat Exchange 3.01</td>
<td>Grady Profile Personna Plus</td>
</tr>
<tr>
<td><strong>Structure &amp; Links</strong></td>
<td>Structured fields/records/files linked together by common fields</td>
<td>Electronic cards (screens) linked together by “buttons”</td>
<td>Icon-based or time-based multimedia authoring environment</td>
<td>WWW pages viewed with a Web Browser (Netscape or Explorer) using links created in HTML</td>
<td>Postscript-based pages that can be navigated sequentially, or using bookmarks, links, or buttons</td>
<td>Varied: Grady Profile has Hypercard base Personna Plus uses relational database engine</td>
</tr>
<tr>
<td><strong>Player available</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Self-contained</td>
<td>Browser (free)</td>
<td>Reader (free)</td>
<td>?</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>Flexible reporting Network-friendly Web accessible Cross-platform</td>
<td>Widely accessible in classrooms Construction tools included</td>
<td>Most flexibility in development CD-ROM Cross-platform</td>
<td>Web-accessible Cross-platform</td>
<td>Web-accessible Cross-platform Create files from any application Ideal for CD-R</td>
<td>Pre-designed and structured</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Limitation of size of files Requires player</td>
<td>Not directly web-accessible View limited to screen size</td>
<td>Steep learning curve</td>
<td>Multimedia (video) not well integrated Complex authoring</td>
<td>Size of files Limited construction tools</td>
<td>Grady: not Web-accessible, Mac only, inflexible</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td>4 to develop 2 to use</td>
<td>3 to develop 5</td>
<td>2 with editor 4 without</td>
<td>2</td>
<td>2 (Grady) ? (Personna)</td>
<td></td>
</tr>
<tr>
<td><strong>Technology Required</strong></td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td><strong>Cost (with Ed. discounts)</strong></td>
<td>$49</td>
<td>$39-$199</td>
<td>$150-$1,000</td>
<td>$49-$79</td>
<td>$49</td>
<td>Grady $195 Personna ?</td>
</tr>
</tbody>
</table>
### Electronic Portfolio Development Tools

<table>
<thead>
<tr>
<th>Software environment</th>
<th>Relational data base</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Development Tools</td>
<td>Filemaker Pro, Microsoft Access</td>
</tr>
<tr>
<td>Structure and links</td>
<td>Structured fields/records/files linked together by common fields</td>
</tr>
<tr>
<td>Advantages</td>
<td>Flexible reporting - Network-friendly - Web-accessible - Cross Platform Most effective in tracking and reporting achievement of standards</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Limitation on size of files - Requires player - Requires higher skill level to develop</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>4 to develop 2 to use</td>
</tr>
<tr>
<td>Technology Required</td>
<td>3</td>
</tr>
<tr>
<td>Cost with ed. discounts</td>
<td>$49-$199</td>
</tr>
<tr>
<td>Player available</td>
<td>Yes - free</td>
</tr>
</tbody>
</table>

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### Electronic Portfolio Development Tools

#### Software environment

**Hypermedia “card” file (including templates)**

#### Common Development Tools

- HyperStudio, Digital Chisel, HyperCard, Toolbook

#### Structure and links

Electronic cards (screens) linked together by “buttons”

#### Advantages

- Widely accessible in classroom. Construction and display tools available in one program.

#### Disadvantages

- Not directly web-accessible. View limited to screen size. Effort required to link standards and portfolio artifacts.

#### Ease of Use

- 3 to develop

#### Technology Required

- 3

#### Cost with ed. discounts

- $39-$199

#### Player available

- Yes - free

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**Electronic Portfolio Development Tools**

<table>
<thead>
<tr>
<th>Software environment</th>
<th>Multimedia authoring software</th>
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</tr>
<tr>
<td>Advantages</td>
<td>Most flexibility in developing for CD-ROM publishing. Cross-platform.</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Steep learning curve. Effort required to link standards and portfolio artifacts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ease of Use</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Required</td>
<td>5</td>
</tr>
<tr>
<td>Cost with ed. discounts</td>
<td>$150-$1000</td>
</tr>
<tr>
<td>Player available</td>
<td>Self-contained files</td>
</tr>
</tbody>
</table>

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### Electronic Portfolio Development Tools

<table>
<thead>
<tr>
<th>Software environment</th>
<th>World Wide Web Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Development Tools</strong></td>
<td>Adobe PageMill, Claris Home Page, Microsoft Front Page, many more</td>
</tr>
<tr>
<td><strong>Structure and links</strong></td>
<td>WWW pages viewed with a Web Browser (Netscape or Explorer) using links created in HTML</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>Web-accessible. Cross-platform.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Multimedia (video) not well integrated. Complex authoring environment.</td>
</tr>
<tr>
<td><strong>Ease of Use</strong></td>
<td>2 with editor</td>
</tr>
<tr>
<td><strong>Technology Required</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>Cost with ed. discounts</strong></td>
<td>free - $99</td>
</tr>
<tr>
<td><strong>Player available</strong></td>
<td>Web browser - free</td>
</tr>
</tbody>
</table>
## Electronic Portfolio Development Tools

### Software environment

<table>
<thead>
<tr>
<th>Adobe Acrobat Reader</th>
</tr>
</thead>
</table>

### Common Development Tools

<table>
<thead>
<tr>
<th>Adobe Acrobat Exchange 3.01</th>
</tr>
</thead>
</table>

### Structure and links

- Postscript-based pages that can be navigated sequentially, or using bookmarks, links, or buttons

### Advantages

- Web-accessible.
- Cross-platform.
- Create files from any application.
- Ideal for Compact-disc-recordable portfolios.
- Handles multimedia well.

### Disadvantages

- Size of file.
- Limited built-in editing tools.
- Requires another program to create files.

### Ease of Use

| 2 |

### Technology Required

| 4 |

### Cost with ed. discounts

| $49 |

### Player available

| Acrobat Reader - free |

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What is PDF?

- PDF stands for Portable Document Format.
- It was developed by Adobe Corporation to allow efficient electronic distribution of large documents.
What is PDF?

- A PDF file will look the same on the screen and in print regardless of what kind of computer you are using or which software package it was created from.
- A large document can be compressed small enough to download quickly, and displays text and pictures as if you were looking at the original book or brochure.
# Electronic Portfolio Development Tools

## Software environment

<table>
<thead>
<tr>
<th>Proprietary Software</th>
</tr>
</thead>
</table>

## Common Development Tools

| Grady Profile, Personna Plus |

## Structure and links

| Varied: Grady Profile has HyperCard base. Personna Plus uses relational database engine. |

## Advantages

| Pre-designed and structured. |

## Disadvantages

| Grady: not web-accessible, Mac only, inflexible layout. Personna: ? |

## Ease of Use

| 2 (Grady Profile) | ? (Personna Plus) |

## Technology Required

| 2-4 |

## Cost with ed. discounts

| Grady $195 |

## Player available

<p>| ? |</p>
<table>
<thead>
<tr>
<th>Software environment</th>
<th>Multimedia Slide Shows</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Common Development Tools</strong></td>
<td>PowerPoint, ClarisWorks Slide Show, Astound</td>
</tr>
<tr>
<td><strong>Structure and links</strong></td>
<td>Electronic slides, most often shown in linear sequence.</td>
</tr>
<tr>
<td><strong>Advantages</strong></td>
<td>Commonly-available tool.</td>
</tr>
<tr>
<td><strong>Disadvantages</strong></td>
<td>Availability of hypertext links between standards and portfolio artifacts.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ease of Use</th>
<th>Technology Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost with ed. discounts</th>
<th>$29+</th>
</tr>
</thead>
</table>

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# Electronic Portfolio Development Tools

## Software environment

**Digital Video**

## Common Development Tools

- Avid Cinema, Adobe Premiere, Movie Player Pro, Apple Video Player

## Structure and links

- Digitized video, usually in QuickTime or AVI format

## Advantages

- WWW access, high interactivity, random access, editing

## Disadvantages

- File size, storage, quality, bandwidth requirements, hardware requirements to digitize.

## Ease of Use

| 5 |

## Technology Required

| 5 |

## Cost with ed. discounts

| $29+++ |

## Player available

| Yes - Free |

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Electronic Portfolio Development Tools

Software environment
Analog Video

Common Development Tools
video editors

Structure and links
analog video on a variety of formats (i.e., VHS, 8mm)

Advantages
ubiquitous access, cheap storage media, acceptable quality, relatively low cost hardware requirements

Disadvantages
linear access, low interactivity, no www access, storage, editing

Ease of Use
4

Technology Required
1

Cost with ed. discounts
?

Player available
VCR

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| **Portfolio Software**  
| * Site licenses and educational discounts are available. | **Cost per Machine** | **Appropriate age level (by grade level)** | **Recommended Level of Technology Infrastructure** | **Recommended Level of Teacher Technology Competency** |
|---|---|---|---|---|---|
| Open Doc & CyberDog | >$50 | 4-Adult | 5 | 3 |
| HTML - Web Pages | $0 | 7-Adult | 5 | 4 |
| HTML with Web Authoring tool | ~$99 | 5-Adult | 5 | 3 |
| HyperStudio | >$129 | K-Adult | 4 | 2 |
| Designer Portfolio Template for HyperStudio | $65 | K-6 | 4 | 2 |
| Grady Profile | $195 | Pre-K-6 | 3 | 1 |
| G P Newton Companion | $99 | T | 3 | 3 |
| FileMaker Pro 3.0 | ~$199 | T | 3 | 2 |
| HyperCard | $199 | 7-Adult | 3 | 3 |
| Adobe Acrobat Exchange | $149 | 9-Adult | 4 | 2 |
| Macromedia Director | $499 | 9-Adult | 5 | 5 |
| Scholastic Electronic Portfolio | $299 | K-12 | 4 | 4 |
| Learner Profile | $299 | T | 3 | 4 |
| Newton or Bar Code Reader | ~$400 | T | 3 | 4 |
| KidPix & KidPix Companion | $39 | K-4 | 2 | 1 |
Why create a digital portfolio in PDF rather than HTML?

- NO programming or coding files - easier to learn
- WYSIWYG - PDF files look exactly like the original document
- All one document, not fragmented files (graphics & text)
- Easier to integrate multimedia (sound and video)
Why create a digital portfolio in PDF rather than HTML?

- Ideal format for CD-ROM
- Easily integrate documents created by a variety of different software packages
- A variety of ways to navigate a document:
  - Bookmarks
  - Links
  - Thumbnails
  - Toolbar
# HTML or PDF?

<table>
<thead>
<tr>
<th>HTML Works Best</th>
<th>Both Work Well</th>
<th>PDF Works Best</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTML WSSI/WYG editors</td>
<td>Word processing programs</td>
<td>Desktop publishing programs</td>
</tr>
<tr>
<td>Text editors</td>
<td>Spreadsheet programs</td>
<td>Illustration programs</td>
</tr>
<tr>
<td>Database programs</td>
<td>Document yet to be created</td>
<td>Presentation software</td>
</tr>
<tr>
<td>Documents already tagged (SGML)</td>
<td>Document in RTF format</td>
<td>Document already produced</td>
</tr>
<tr>
<td>e-mail</td>
<td>Basic specification sheets</td>
<td>Document exists on paper only</td>
</tr>
<tr>
<td>Memos</td>
<td>Graphs</td>
<td>Newsletters</td>
</tr>
<tr>
<td>Basic letters</td>
<td>Order forms (information receipt)</td>
<td>Magazines</td>
</tr>
<tr>
<td>Simple reports</td>
<td>Links to URL's (WWW)</td>
<td>Posters</td>
</tr>
<tr>
<td>Various text-based documents</td>
<td>Mailto: links</td>
<td>Annual reports</td>
</tr>
<tr>
<td>Server-side information (two-way)</td>
<td>CGI's (Image maps)</td>
<td>Books, brochures</td>
</tr>
<tr>
<td>Server-push information</td>
<td>Forms</td>
<td>URL's with links over text &amp; graphics</td>
</tr>
<tr>
<td>Index service (search and retrieve)</td>
<td></td>
<td>Document-based security</td>
</tr>
<tr>
<td>Database connectivity</td>
<td></td>
<td>Movie and sound playback</td>
</tr>
<tr>
<td>Frames</td>
<td></td>
<td>High-resolution images</td>
</tr>
<tr>
<td>Java applets</td>
<td></td>
<td>Page numbers</td>
</tr>
</tbody>
</table>


Other References:


Any authoring application

Print to PDF
Printer Driver

Postscript printer driver

PDF Writer

Print to File

Postscript file

Acrobat Distiller

PDF File

Edit/Links/Bookmarks
Acrobat Exchange
$40 ed. price

View/Print/Search
Acrobat Reader
(free)

Distribute
Browser
E-mail
Print
CD
File Server
Diskette
Develop

- gather **multimedia materials** to include in the portfolio which represent learner's achievement (preferably linked to standards, preferably in a relational database)

- record **student self-reflection** on work and achievement of goals

- record **teacher feedback** on student work and achievement of goals

- organize with **hypermedia links** between goals, student work samples, rubrics, and assessment
Collection

- The primary activity of a working portfolio.
- Don’t save everything!
- Purpose and audience and future use of artifacts will determine content.
Selection

- Students examine what has been collected to decide what should be moved to a more permanent assessment or display portfolio.

- Criteria should reflect the learning objectives of the curriculum.

  (Danielson & Abrutyn [ASCD], 1997, p. 13)

- This is where many electronic portfolios end!
Reflection

- Students articulate their thinking about each piece in their portfolio.
- Through this process of reflection, students become increasingly aware of themselves as learners.
- Use reflective prompts.
- Include reflections on every piece plus overall reflection on entire portfolio.

(Danielson & Abrutyn [ASCD], 1997, pp.15-16)
Reflection

“The use of portfolios not only helps students make better progress on the skills in the curriculum; it also helps them develop critical skills such as reflection and self-evaluation which are fundamental to excellence in any walk of life.”

(Danielson & Abrutyn [ASCD], 1997, p. 26)
Most states have adopted standards for both students, practicing teachers, and new teachers. These standards form an ideal framework for thinking about organizing an electronic portfolio.
A portfolio without standards:

- is just a multimedia presentation
- or a fancy electronic resume
- or a digital scrapbook
High technology disconnected from a focus on curriculum standards will only exacerbate the lack of meaningful integration of technology into teaching and learning.
Evaluate

- **present** portfolio to appropriate audience (by student, in age-appropriate situations)
- **evaluate** effectiveness of portfolio related to the purpose and assessment context
Projection

- Looking ahead and setting goals for the future.
- Students see patterns in their work.
- These observations can help identify goals for future learning.

(Danielson & Abrutyn [ASCD], 1997, p. 18)
Helen C. Barrett, Ph.D.

- Web Site on Electronic Portfolios
  http://transition.alaska.edu/www/portfolios.html
  (soon) http://portfolios.alaska.edu/

- Listserv: el-port@uaa.alaska.edu

- E-mail: afhcb@uaa.alaska.edu