Electronic Teaching Portfolios: Multimedia Skills + Portfolio Development = Powerful Professional Development

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Abstract: Two bodies of literature define the process for developing electronic teaching portfolios to support long-term professional growth: the multimedia development process (Decide/Assess, Design/Plan, Develop, Implement, Evaluate) and the portfolio development process (Collection, Selection, Reflection, Projection/Direction, Presentation). As further defined, the Electronic Portfolio Development Process covers the following stages: Defining the Portfolio Context and Goals, the Working Portfolio, the Reflective Portfolio, the Connected Portfolio, and the Presentation Portfolio. In addition, there are at least five levels of technology for developing electronic portfolios, based on ease of use, including technologies that are appropriate at each level and stage. This combined process creates a foundation for powerful professional development.

The process of developing electronic teaching portfolios can document evidence of teacher competencies and guide long-term professional development. The competencies may be locally defined, or linked to national teaching standards. Two primary assumptions in this process are: 1.) a portfolio is not a haphazard collection of artifacts (i.e., a scrapbook) but rather a reflective tool which demonstrates growth over time; and 2.) as we move to more standards-based teacher performance assessment, we need new tools to record and organize evidence of successful teaching, for both practicing professionals and student teachers.

Electronic portfolio development draws on two bodies of literature: multimedia development (decide, design, develop, evaluate) (Ivers & Barron, 1998) and portfolio development (collection, selection, reflection, projection) (Danielson & Abrutyn, 1997). Both processes are complimentary and essential for effective electronic portfolio development. Understanding how these two processes fit together, along with understanding the role of standards in electronic portfolio development, will provide teachers and students with a powerful tool for demonstrating **growth over time** which is the primary value of a portfolio.

For the last decade, students at the University of Alaska Anchorage (UAA) School of Education have developed exit portfolios, initially in the Adult Education Masters Program and most recently to earn an institutional recommendation for a teaching certificate under UAA's MAT in Secondary Education. An electronic portfolio based on the ISTE/NCATE Standards is now required to earn the new competency-based Educational Technology Endorsement for the state of Alaska. In addition, teachers have been developing electronic portfolios to demonstrate their achievement of the Alaska Teaching Standards, and their reflections show the power of the teaching portfolio to guide lomg-term professional development.

Benefits of Electronic Portfolio Development

Based on research into the implementation of electronic portfolios since 1991, the following benefits appear to result from developing electronic portfolios with teachers and students:

1. Creating an electronic portfolio can develop teachers' as well as students' multimedia technology skills. The **multimedia development process** usually covers the following stages (Ivers & Barron, 1998):
   - Decide/Assess - determining needs, goals, audience for the presentation
   - Design/Plan - determining content, sequence of the presentation
   - Develop - Gather and organize multimedia materials to include in the presentation
   - Implement - Give the presentation
   - Evaluate - Evaluate the presentation's effectiveness

2. Modeling: If teachers develop electronic teaching portfolios, their students will be more likely to have their own electronic portfolios.

3. Each stage of the **portfolio development process** contributes to teachers' professional development and students' lifelong learning:
- Collection - teachers and students learn to save artifacts that represent the successes (and "growth opportunities") in their day-to-day teaching and learning
- Selection - teachers and students review and evaluate the artifacts they have saved, and identify those that demonstrate achievement of specific standards (this is where many electronic portfolios stop)
- Reflection - teachers and students become reflective practitioners, evaluating their own growth over time and their achievement of the standards, as well as the gaps in their development
- Projection (or Direction) - teachers and students compare their reflections to the standards and performance indicators, and set learning goals for the future. This is the stage that turns portfolio development into professional development and supports lifelong learning.
- Presentation - teachers and students share their portfolios with their peers. This is the stage where appropriate "public" commitments can be made to encourage collaboration and commitment to professional development and lifelong learning.

Robin Fogarty, Kay Burke, and Susan Belgrad (1994, 1996) have identified ten options for portfolio development, further defining the stages and increasing the quality of the portfolio process:

1. PROJECT purposes and uses
2. COLLECT and organize
3. SELECT valued artifacts
4. INTERJECT personality
5. REFLECT metacognitively
6. INSPECT and self-assess goals
7. PERFECT, evaluate, and grade (if you must)
8. CONNECT and conference
9. INJECT AND EJECT to update
10. RESPECT accomplishments and show pride

Figure 1: Portfolio Development Options

The Electronic Portfolio Development Process –Five Stages and Five Levels

From the discussion of both the Multimedia Development Process and the Portfolio Development Process, along with a discussion of the appropriate technology tools, five stages of **Electronic Portfolio Development** emerge. Here are the issues to address at each stage of this process.

Portfolio Development	**Stages of Electronic Portfolio Development**	*Multimedia Development*
Purpose & Audience	**1. Defining the Portfolio Context & Goals**	*Decide, Assess*
Collect, Interject	**2. The Working Portfolio**	*Design, Plan*
Select, Reflect, Direct	**3. The Reflective Portfolio**	*Develop*
Inspect, Perfect, Connect	**4. The Connected Portfolio**	*Implement, Evaluate*
Respect (Celebrate)	**5. The Presentation Portfolio**	*Present, Publish*

Table 1: Stages of Electronic Portfolio Development

Differentiating the Levels of Electronic Portfolio Implementation

In addition to the stages of portfolio development, there appear to be at least five levels of electronic portfolio development. In reviewing the electronic portfolios that are produced, it is important to establish different expectation levels for development. Just as there are developmental levels in student learning, there are developmental levels in digital portfolio development. Below are different levels for digital multimedia development and electronic portfolio development, which are closely aligned with the technology skills of the student or teacher portfolio developer.

0	1	2	3	4	5
All documents are in paper format. Some portfolio data may be stored on video tape.	All documents are in digital file formats, using word processing or other commonly-used software, and stored in electronic folders on a hard drive, floppy diskette or LAN server.	Portfolio data is entered into a structured format, such as a database or HyperStudio template or slide show (PowerPoint or AppleWorks) and stored on a hard drive, Zip, floppy diskette or LAN server.	Documents are translated into Portable Document Format with "hyper-links" between standards, artifacts, and reflections using Adobe Acrobat Exchange and stored on a hard drive, Zip, Jaz, CD-R/W, or LAN server.	Documents are translated into HTML, complete with "hyper-links" between standards, artifacts, and reflections, using a web authoring program and posted to a WWW server.	Portfolio is organized with a multimedia authoring program, incorporating digital sound and video is converted to digital format and pressed to CD-R/W or posted to WWW in streaming format.

Table 2: Levels of Digital Portfolio Software Strategies based on Ease of Use

STAGE 1: DEFINING THE PORTFOLIO CONTEXT & GOALS
    Multimedia Development: **Decide/Assess**   Portfolio Development: **Purpose & Audience**
Tasks:
- Identify the assessment context, including the **purpose** of the portfolio.
- Identify the learner outcome goals (which should follow from national, state, or local standards and their associated evaluation rubrics or observable behaviors). This is a very important step, setting the assessment context, which should help frame the rest of the portfolio development process.
- Identify the **resources** available for electronic portfolio development.
- Identify the hardware and software available and how often students have access.
- Assess the technology skills of the students and teachers
- Identify the **audience** for the portfolio--student, parent, college, employer (often based on the age of the student). The primary audience for the portfolio will contribute to the decisions made about the format and storage of the formal or presentation portfolio. Choose a format that the audience will most likely have access to; i.e., parents may not have a home computer, but may have a VCR.

Appropriate Technology Tools at this Stage:
- Use whatever software tools are currently being used to collect artifacts, storing them on a hard drive, a server, or videotape.
- Set up electronic folders for each standard to organize the collection of artifacts (any type of electronic document). *[Level 1]* **AND**
- Use a word processor, database, hypermedia software or slide show to articulate the standards to be demonstrated in the portfolio and to organize the artifacts. *[Level 2]* **OR**
- Use an HTML editor to articulate the standards to be demonstrated in the portfolio and to organize the artifacts. *[Level 4]* **OR**
- Use a multimedia authoring program to organize by the standards to be demonstrated in the portfolio. *[Level 5]*

STAGE 2: THE WORKING PORTFOLIO

Multimedia Development: **Design/Plan**   Portfolio Development: **Collect, Interject**

Tasks:

- Identify the content of portfolio items (determined by the assessment context) and the type of evidence to be collected. This is where the standards become a very important part of the planning process. Knowing which standards are being demonstrated should help determine the types of portfolio artifacts are to be collected and then selected.
- Select the software development tools most appropriate for the portfolio context and the resources available. Just as McLuhan said, "The medium is the message", the software used to create the electronic portfolio will control, restrict, or enhance the portfolio development process. Form should follow function as well, and the electronic portfolio software should match the vision and style of the portfolio developer.
- Identify the storage and presentation medium most appropriate for the situation (i.e., computer hard disk, videotape, local-area network, a WWW server, CD-ROM, etc.). The audience for the portfolio will have a major impact on this component. There are also multiple options, depending on the software chosen.
- Gather the multimedia materials that represent a learner's achievement. Once the questions on portfolio context and content have been answered, as well as the limitations on the type of equipment available and the skills of the users (teachers and students), the portfolio developer will be able to determine the type of materials to digitize, such as: student written work, images of student projects, sounds of students speaking or reading, and video clips of student performances. Of course, if will be appropriate to collect artifacts from different points of time to demonstrate growth and learning that has taken place.
- Interject personality into the portfolio design. Use some of the graphics capabilities of current computer systems to add style and flair to the portfolio.

Appropriate Technology Tools at this Stage:

Select software tools to organize selected artifacts:

- Use Word Processing, Slide Shows, Hypermedia, or Database programs to list and organize the artifacts that will be placed in the Working Portfolio. *[Level 2]* **OR**
- Use an HTML editor (or any tool that is normally used) to develop and organize the artifacts for the Working Portfolio. *[Level 4]* **OR**
- Use a multimedia authoring program to organize the selected artifacts. *[Level 5]*

Convert portfolio artifacts into digital format

- Use appropriate multimedia to add style and individuality to portfolio.
- Use a scanner (or camera) to digitize images *[Level 2]*
- Use a microphone and sound digitizing program to digitize audio artifacts *[Level 4]*
- Use a video camera, digitizing hardware and software to digitize video artifacts *[Level 5]*

1	2	3	4	5
Text Only	Add Images	Add Navigation (hypertext links)	Add digitized sound	Add digitized video

Table 3: Levels of Digital Multimedia Development

STAGE 3: THE REFLECTIVE PORTFOLIO

Multimedia Development: **Develop**   Portfolio Development: **Select, Reflect, Direct**

Tasks:

- Record **self-reflection** on work and achievement of goals. The quality of the learning that results from the portfolio development process will be in direct proportion to the quality of the self-reflection on the work. One challenge in this process will be the need for confidentiality of these reflections. This is the place where the personal, private reflections of the learner need to be guarded, and not published in a public medium.

- Record **feedback** on work and achievement of goals. Even more critical is the confidential nature of the assessment process. Feedback should also be kept confidential so that only the student, parents and other appropriate audiences have access, and not published in a public medium.
- Write general reflective statements on achieving each standard.
- Select the artifacts that represent achievement of the standards or goals.
- Write reflective statements for each artifact, elaborating on why it was selected and its meaning and value in the portfolio.
- From the reflections and feedback, set learning goals for the future.

Appropriate Technology Tools at this Stage:
- Use Word Processing, Slide Shows, Hypermedia, or Database programs to record the reflections and future goals that will become the Reflective Portfolio. *[Level 2]* **OR**
- Use an HTML editor (or any tool that is normally used) to record the reflections and future goals that will become the Reflective Portfolio. *[Level 4]* **OR**
- Use a multimedia authoring program to record the reflections and future goals that will become the Reflective Portfolio. *[Level 5]*

STAGE 4: THE CONNECTED PORTFOLIO
Multimedia Development: **Implement, Evaluate**   Portfolio Development: **Inspect, Perfect, Connect**
Tasks:
- **Organize the digital artifacts**. Use software that allows the creation of **hypertext links** between goals, student work samples, rubrics, and assessment. The choice of software can either restrict or enhance the development process and the quality of the final product. Different software packages each have unique characteristics which can limit or expand the electronic portfolio options.
- **Identify patterns** through the "linking" process.
- **Final review** of the portfolio and goals.
- **Share** the portfolios with an appropriate audience. This will be a very individual strategy, depending on the context. An emerging strategy is the use of student-led conferences, which enable learners to share their portfolios with an appropriate audience, whether parents, peers, or potential employers. This is also an opportunity for professionals to share their teaching portfolios with colleagues for meaningful feedback and collaboration in self-assessment. This "public commitment" provides motivation to carry out the plan.
- **Evaluate** the portfolio's effectiveness in light of its purpose and the assessment context. In an environment of continuous improvement, a portfolio should be viewed as an ongoing learning tool, and its effectiveness should be reviewed on a regular basis to be sure that it is meeting the goals set.
- Depending on portfolio context, use the portfolio evidence to make instruction/learning or professional development decisions. Whether the portfolio is developed with a young child or a practicing professional, the artifacts collected along with the self-reflection should help guide learning decisions. This process brings together instruction and assessment, portfolio development and professional development, in a most effective way.

Appropriate Technology Tools at this Stage:
- Convert word processing, database or slide show documents into either PDF *[Level 3]* or HTML *[Level 4]* **AND**
- Create hypertext links between goals, student work samples, rubrics, and assessment.
- Insert multimedia artifacts *[Level 3 & 4]* **OR**
- Create a hypermedia presentation using a multimedia authoring program, creating links between goals, multimedia work samples, rubrics, and assessment. *[Level 5]*

STAGE 5: THE PRESENTATION PORTFOLIO
    Multimedia Development: **Present**, **Publish**   Portfolio Development: **Respect (Celebrate)**
Tasks:
- **Record** the portfolio to an appropriate presentation and storage medium. This will be different for a working portfolio and a formal or presentation portfolio. The best medium for a working portfolio is video tape, computer hard disk, Zip disk, or network server. The best medium for a formal portfolio is CD-Recordable disc, WWW server, or video tape.
- **Present** the portfolio before an audience (real or virtual) and celebrate the accomplishments represented.

Appropriate Technology Tools at this Stage:
- Post the portfolio to WWW server **OR**
- Write the portfolio to CD-ROM **OR**
- Record the portfolio to videotape

1	2	3	4	5
Floppy Diskette Hard Disk Drive	Zip Disk/Super Disk Jaz Disk	LAN Server	CD-R/W	WWW Server

Table 4: Levels of Digital Storage

Conclusions

The process of creating an electronic teaching portfolio should incorporate not only multimedia technology skills, but also the portfolio development process. Otherwise, we will continue to produce web pages or multimedia presentations masquerading as electronic portfolios; a portfolio without goals (or standards) and reflections is just a multimedia presentation, or a fancy electronic resume, or a digital scrapbook. By following the portfolio development process as defined above, including reflection, direction (goal-setting) and connection (dialogue with others about the portfolio), a teacher creates a foundation for powerful professional development.

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