A Personalized, Web-Based Electronic Portfolio Workspace


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Abstract

my.STEP.Stanford is a conceptual design for a personalized, web-based Electronic Portfolio Workspace that provides pre-service teachers in the Stanford Teacher Education Program (STEP) with a fast and effective way to organize, reflect upon and share their pre-service teaching and learning experiences. The design not only facilitates storing and organizing multimedia artifacts that demonstrate teaching proficiency, but it also promotes reflective thinking, facilitates collaboration with STEP peers and supervisors, and simplifies the creation of an electronic portfolio. By using the ePortfolio Workspace, STEP students will find themselves saving time and learning more as they create a professional portfolio of their teaching practices.

This design was created to assist the STEP program in strategic planning and envisioning ways to effectively integrate technology into the STEP learning experience. The Key Learning Design Principles that were utilized to guide the design were from research on scaffolding metacognition (reflection) and the design of communities of learners. The design process used to create my.STEP.Stanford relied on STEP program Informants and the development of scenarios of use. Additional information about the design affordances for community and collaboration by Keri Morgret can be found online at http://ldt.stanford.edu/~keri/project/index.html.
Background – Current Practices and Challenges

The STEP program requires that pre-service teachers engage in reflective thinking about their new teaching practices and asks that they collect samples of their work into electronic portfolios. At the heart of STEP is analysis and reflection:

“...powerful education requires that teachers and principals be able to analyze and reflect on their practice. Individually and with others, they need to assess the effects of their work and to refine and improve their practice...”

1 Rachel Lotan, STEP director, from the STEP “Framework”

The STEP program is an active Face-to-Face community, with subgroups sorted by subject area (under curriculum and instruction) and supervisor. There is also a move toward clustering student teaching at fewer school sites, creating another subgroup for interaction.

The electronic portfolios that STEP students have been creating in the past are both CD’s of their work, and web-deliverable artifacts such as PDF files of lesson plans. Over time, STEP would like to create a library of web-deliverable lesson plans for current STEP students and alumni.

The tools being used include Microsoft Word & Powerpoint, Apple iMovie, Frontpage, Adobe Acrobat, and for some advanced students, tools like Macromedia Dreamweaver. Document management approaches have included the use of web-server space, networked file storage, and Xerox Docushare.

However, STEP pre-service teachers are confronted with numerous obstacles. Collecting examples of their teaching practice and its impact on students’ learning is cumbersome at best, and can quickly become a logistical nightmare, especially when dealing with large video files. According to one STEP student,

"Organizing my video clips is the most difficult challenge...I would like to be able to look at my teaching from various perspectives (activities, behaviors, by student, over time...)"

Similarly, there with the emphasis on reflection, the students need to quickly develop new approaches to recording their thoughts along the way. One
STEP student recognized the problem, but did not have an adequate working solution:

"I use a paper journal to write my thoughts as I go, but I wonder how I’ll find things later…"

Today’s STEP portfolios are a combination of hard-copy and electronic artifacts. Organizing and archiving their “teaching artifacts” has been problematic, exacerbated in part by the fact that the electronic portfolios are primarily assembled at the end of the program, not along the way, a thought echoed by a STEP alum:

"It’s all about TIME…we were so busy, we’d become isolated. Building the portfolio over time so it is easily finalized in Spring would be a great benefit…”

In a fast-paced program like STEP, there is little to no “extra time”. STEP students, alumni and faculty repeatedly emphasize in interviews that they are under extreme time pressure. There is not time for additional work, and the technologies they are using (iMovie, Frontpage, Dreamweaver, Acrobat, etc) tend to have a significant learning curve. What can be done to make the most of the experience and not short-cut the learning cycle?

In addition, paper-based portfolios and face-to-face meetings have a limited audience, restricting the potential for deeper reflection and dialog with a broader audience. STEP students would like to learn more from their peers and possibly from mentors that are external to the STEP program. Said one STEP alum,

"Time is the biggest obstacle…and we would benefit from more frequent sharing of our work in progress…”

Time pressures are not unique to the STEP program. Teachers participating in professional development programs often find that they short-circuit the learning, leaving little or no time allocated for personal reflection or the collaborative sharing and discussion that refines students’ conceptual understanding2. Challenges include, 1) not enough time to refine and reflect on the experience, 2) insufficient understanding or previous experience regarding the use of portfolios and personal reflection, and 3) infrequent opportunities for in depth conversation and dialog.

As STEP students participate in courses and student teaching, they experience a Learning Cycle that includes iterative reflection (see figure 1

\[2\] Informal interviews with K-8 teachers from the BASEE hands-on science collaborative (www.basee.org)
“simplified learning cycle”). STEP students are required to reflect in formal responses to supervisors, and are encouraged to reflect about their teaching practices informally, too. STEP students describe this as “difficult and time-consuming”, even if they value the outcome. They have not necessarily developed a manageable process of individual reflection. Likewise, they may or may not be receiving adequate or timely scaffolding to support their forays into this new discipline. As a result, many questions remain dangling, or are not addressed in a timely fashion to make the learning optimal.

The learning challenge is therefore, “How do we make the creation of Electronic Portfolios easier and more meaningful?”
System Description

Overview

my.STEP.Stanford is a conceptual design for a personalized, web-based Electronic Portfolio Workspace that provides pre-service teachers in the Stanford Teacher Education Program (STEP) with an effective way to reflect upon and share their teaching and learning experiences. The ePortfolio Workspace creates an easy way to store and organize examples of teaching practices and instantly publish a secure, interactive web-space for discussion and timely feedback between STEP students and faculty.

The design not only facilitates storing and organizing multimedia artifacts that demonstrate teaching proficiency, but it also promotes reflective thinking, facilitates collaboration with STEP peers and supervisors, and simplifies the creation of an electronic portfolio.

Reflection is supported a variety of ways, most notably when electronic artifacts are “dragged and dropped” into electronic binders. This helps the learner capture their thinking about the object and catalog it for future reference.
A key feature of the design is the distinction between private reflections (stored in a binder called “Private Diary”) and artifact information that is accessible to “invited guests”. The Private Diary is a sequential journal of thoughts, and entries cannot be shared (only cut and pasted into sharable threaded discussions).

Reflection is also focused on the **teaching standards**. A “teaching standards” self-assessment worksheet is available at all times, allowing the learner to relate teaching artifacts directly to the teaching standards. This also assists the student in the creation of the summative Portfolio, since the correlation and tabulation of standards is semi-automated, making it easier to confirm proficiency toward the Teaching Standards.

The design is referred to as a “workspace” because it is meant to support the workflow of the STEP experience. It is designed to enhance (not replace) the existing, vibrant, face-to-face STEP community:
Community Discourse between students and/or faculty

- asynchronous threaded discussions and peer review
- synchronous chat for ad-hoc questions and support

Community News

- Delivery of user-specific newsletters (e.g., science C&I students receive the science faculty e-zone)
- Community calendar integrated with a student’s personalized calendar

Community Recognition, through faculty recommended postings to the STEP “Gallery”

Featured Teachers!

See samples of their work and more in the STEP Gallery...

Kathy (Social Studies) - “I enjoy teaching because I learn so much from my students…”

David (Foreign Language) - “My funniest moment in the classroom was…”
Workflow activities that are supported include:

- Document Management – organizing and archiving digital work into “electronic binders”
- Web Publishing – drag-and-drop creation of web delivered portfolios that are accessible by invitation only, eliminating the need to spend time on web-design and management tools
- Course workflow – creating an easy environment for faculty to share course materials, provide assignment feedback, and support collaborative projects between students

my.STEP.Stanford is also designed to support various types of “electronic portfolios”. Using a combination of template and user-created electronic binders, students can create:

- Final STEP Assessment Portfolio, a collection of artifacts that are required for graduation, showing evidence of proficiency relative to Teaching Standards
- Formative Portfolios, where work-in-progress materials or collections of work for sub-projects are stored and made available for invited conversation and private reflection
- Employment Portfolio, which may be selected materials to show to potential employers, separate from the Final Assessment Portfolio
- Course Binders, created by faculty with ownership that is shared with students, creating a way for a class to build a common knowledge base and have easy access to course materials.
- Private Diary, which can serve as an index of all private reflections
- Project Binders – personal or collaborative

The binders accommodate a variety of multimedia objects, storing them in a database that connects with a web server. These multimedia learning artifacts are marked with keyword information for easy retrieval and sorting, and organized into electronic binders:

- digital photos
- notes
- scribbles and drawings
- audio recordings
- digital video
- entries in Teaching Standards reflection forms

Benefits
The **my.STEP.Stanford** system is designed to reduce the time being spent on “technology”, so that STEP students can spend their time thinking about and discussing their new teaching practices.

Creating a portfolio is easier, with the help of templates and checklists. Personal reflection becomes a more meaningful learning experience with the help of self-assessment rubrics that include links to the California Teaching Standards.

Because the ePortfolio Workspace supports online collaboration and discussion, STEP students learn more as they build and share elements from their ePortfolio. Existing STEP face-to-face interactions are enhanced through additional online collaboration and discussion with peers, mentors and supervisors.

By using the **my.STEP.Stanford** workspace, STEP students will:

- Save time when creating their personal STEP portfolio
- Be more effective at gathering, organizing and reflecting on evidence of learning and misconceptions (theirs, or the students in their student-teaching class)
- Obtain better and more timely scaffolding support and feedback from their supervisors, mentors and peers
- Become a better teacher by using the system to quickly create a professional portfolio that can be shared with mentors and administrators, and used in the process of professional certification.
- Quickly create a professional portfolio for viewing by prospective employers

With an effective ePortfolio Workspace, the discussions need not be limited to formally scheduled supervisor-to-learner interactions. Online, asynchronous collaboration tools create new opportunities for in-depth, real-time feedback and discussion between peers, with mentors or others.

**System Architecture**

To accommodate the personalization of information and provide flexibility to present artifacts in various views, the **my.STEP.Stanford** website is a dynamic, data-base driven site. Because every object is stored as a database entry, each object can have associated with it a variety of other objects, such as threaded discussions and personal reflections.
The database system also contains user profiles, allowing the personalization of information being delivered. Unlike static web-sites that deliver far more information than busy people can tolerate, this approach creates a far more practical and focused “workspace” that handles only the relevant information.

The system is web-based so that students can also have access to the system when they are off-campus, either at home or at their student-teaching site.

This architecture accommodates the eventual creation of a web-based transcription service that takes the audio notes recorded on a portable device such as a Pocket, and places the transcription in the user’s private diary.

Any type of multimedia object could be stored in the system. However, due to the size of many video projects, careful capacity planning and requirements for disaster recovery will likely lead to the need for a robust storage and recovery solution. Over time, the storage requirement may exceed multiple terabytes, necessitating Storage Area Network solutions combined with automated tape backup libraries. The size requirements will also impact the database platform decision.
Principled Design Approach

This project is guided by research that provides insight into two “active ingredients” for learning:

- Scaffolding Met cognition and Reflection
- Communities of Learners and Peer Review

Scaffolding Metacognition

For electronic portfolios to successfully support learning, the system (technology and people) must provide reflection support to the learner. As Helen Barrett wisely points out, “... a portfolio without goals (or standards) and reflections is just a multimedia presentation, or a fancy electronic resume.... [By] including reflection, direction (goal-setting), and connection (dialog with others about the portfolio), a teacher creates a foundation for powerful professional development.” To that end, the my.STEP.Stanford design incorporates the Teaching Standards side-by-side with the artifacts themselves. In addition, the reflection forms include scaffolding in the form of examples and prompts.

For examples of prompts, the work from Barbara Levin, University of North Caroline, Greensboro, is quite helpful. “… portfolios [at UNCG] emphasize reflection that requires descriptive, analytical, and transformative writing about the evidence presented in these portfolios...The quality of portfolios has improved...commensurate with the focus we have placed on integrating the reflective cycle into our professional courses.”

This reflective cycle (shown at right) is the centerpiece of the UNCG program, and provided significant insights into appropriate prompts and supports for the my.STEP.Stanford design.

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3 Barrett (2000)
4 Levin (2002)
However, since the busy schedule of STEP students does not allow them to “stop and reflect” for very long, the my.STEP.Stanford design must capture these thoughts on-the-fly. “The ability to think about what one does and why - assessing past actions, current situations, and intended outcomes - is vital to intelligent practice, practice that is reflective rather than routine. As the time in the teaching process when teachers stop to think about their work and make sense of it, reflection influences how one grows as a professional by influencing how successfully one is able to learn from one’s experiences.”

The use of portfolios is predicated on the recognition that the certification of new teachers cannot depend on simplified tests that focus on declarative knowledge. Linda Mabry states that, “…in recent years, educators and educational researchers have recognized and documented serious human and educational consequences of standardized assessment of student achievement, such as narrowing of curricula to subjects, topics, and skills readily tested by multiple-choice items... reducing pedagogy to the teaching and memorizing of “miscellaneous dead facts”…” By making the Teaching Standards a focal point of the design of my.STEP.Stanford, the workspace becomes a tool of performance based assessment.

According to Linda Mabry, assessment researcher and associate of the National Center of the Improvement of Educational Assessment, there is a tremendous need for alternative forms of assessment, many of which are supported by the existence of learning portfolios. “Adopting the personalized paradigm requires radical assessment reform (fitting with) ... the shift in educational research toward qualitative understanding of complex, contextualized phenomena ... (and) the shift in student assessment toward personalization and recognition of individual achievement rather than standardization in test-defined academic areas.”

It is Mabry’s view that system for alternative assessment, such as my.STEP.Stanford, must be designed to provide:

- Flexibility “to select entries that would show a student’s unique accomplishments” (vs. prescribed content) – hence the design includes user-created electronic binders, in addition to templated “required binders”, like the summative Electronic Portfolio;
- A mechanism for “crediting unique and unexpected aspects of performance” – so the design accommodates any type of electronic file or multimedia object;

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6 Richert (1990) p. 509-527
7 Mabry (1999) p.26
8 Mabry (1999) p. 34
9 Mabry (1999) p. 35
More than just a grade, but “individualized critique and suggestions” – to this end, every object in an electronic binder can be commented on, by invitation;

“... a real opportunity for self-evaluation” – which is accomplished through a combination of “private reflections” and “standards-focused reflections” throughout the my.STEP.Stanford system.

It is also recognized that experience with the use of portfolios will be a valuable practice throughout their professional career as educators.

According to Darling-Hammond and Falk, real-world performance assessments should accommodate, “...a broad range of performances, including essay examinations, oral presentations, collections of written products, solutions to problems, records of experiments, debates, and research projects by individuals and groups. They also include teacher observations and inventories of students’ work and learning.”\(^\text{10}\) This was accomplished in my.STEP.Stanford by accommodating any electronic artifacts and supporting supervisor feedback on discussion.

The use of portfolios and personal reflection is a key element to developing a deep understanding of almost any knowledge domain. The STEP program framework that has students engaged in metacognitive exercises aimed at refining their thinking and conceptions about teaching is affirmed by numerous authors. “...learning is most effective when people engage in ‘deliberate practice’ that includes active monitoring of one’s learning experiences”.\(^\text{11}\) The Electronic Portfolio Workspace design, therefore, activates this “deliberate practice” at every moment possible. For example, the process of uploading (dragging and dropping) artifacts into the database includes an opportunity to describe the object and reflect on the teaching standards that are represented in the artifact.

Deliberate practice is further enhanced by the presence of student-specific Teaching Standards and self-reflection worksheets. This supports Bransford’s notion of Active Monitoring. “Transfer can be improved by helping students become more aware of themselves as learners who actively monitor their learning strategies and resources and assess their readiness... Metacognitive approaches to instruction have been shown to increase the degree to which students will transfer to new situations without the need for explicit prompting.”\(^\text{12}\)

This self awareness is supported in the design through the presence of learner-specific Teaching Standards in the form of self-reflection

\(^{10}\) Darling-Hammond & Falk (1997) p 196  
“worksheets”. This supports self-monitoring and provides a focal point for formative discussions with supervisors and faculty. This is significant to Bransford (et al), who said “While time on task is necessary for learning, it is not sufficient for effective learning.... In order for learners to gain insight into their learning and their understanding, frequent feedback is critical: students need to monitor their learning and actively evaluate strategies and their current levels of understanding.”

To be effective, reflection must be highly personalized and very iterative.

In summarizing recommendations regarding student assessment, Pelligrino, et al, believe technology can be a benefit. “Developers are urged to take advantage of opportunities afforded by technology to assess what students are learning at fine levels of detail, with appropriate frequency, and in ways that are tightly integrated with instruction....(but the tools) must be packaged in ways that are practical for use by teachers.” This requirement for “practicality” is quite applicable to the STEP program and whatever design approach is used for electronic portfolios. The my.STEP.Stanford workspace, therefore, includes a blend of structured (templated eBinders) and customizable elements (user-defined eBinders).

Portfolios have the potential to support performance assessment. Pelligrino, et al, recommend that assessment design include all three “corners” of the “assessment triangle”, where “... the corners of the triangle represent three key elements that underlie any assessment: (1) a model of student cognition and learning in the domain, (2) a set of beliefs about the kinds of observations that will provide evidence of students’ competencies, and (3) an interpretation process for making sense of the evidence.”

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Communities of Learners and Peer Review

The “SHARE” process in STEP today is primarily a face-to-face encounter between STEP students and their supervisor, and perhaps a limited set of peers. The my.STEP.Stanford workspace is designed to enhance, not replace, this face to face community.

A detailed review of the literature that informed the design of community affordances can be found online at http://ldt.stanford.edu/~keri/project/index.html, by Keri Morgret.

“The idea of a community of learners is based on the premise that learning occurs as people participate in shared endeavors with others, with all playing active but often asymmetrical roles in socio-cultural activity....it is a community working together with all serving as resources to the others, with varying roles according to their understanding of the activity at hand and differing responsibilities in the system.”17

“The third insight of Activity Theory is that cognition and the cultural tools that mediate it have their origins in social interaction. In particular, it stresses that the higher order psychological functions develop first interpsychologically, and then are translated into intrapsychological, mental functions.”18

“Our media technologies need to be vivified to match highly interactive conversational needs. They should allow for the expansion of these transformative capacities of human communication for learning within and across schools.”19

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17 Rogoff (1994) p.209, 214
18 Gifford & Enyedy (1999) p 5, also quoting Vygotsky (1978)
19 Pea (1996) p.178
Current Practice and Existing Alternatives

Helen Barrett, University of Alaska, chaired the Electronic Portfolios papers presented at the SITE 2002 conference. In the introduction to the written papers from the proceedings, Barrett summarized the current state of the art for ePortfolio use by teacher pre-service institutions. Regarding portfolio purposes, she describes that ePortfolios are primarily used to demonstrate student achievement toward teaching standards, though the portfolios are adapted for learning, for assessment, and for employment.20

The approaches to implementation, cited by Barrett, fall into two basic categories. The first is static hyperlinked online documents or websites, and the second is web-based database-driven dynamic websites, such as my.STEP.Stanford.

A survey of existing Electronic Portfolio practices was conducted by Keri Morgret, the details of which can be found online at http://ldt.stanford.edu/~keri/project/index.html. Perhaps the most advanced ePortfolio system that was found is from Florida State University, for students to create “career portfolios”:

“Current practice for portfolios ranges from collecting evidence of one’s work in a binder (paper based) to web templates with basic subheadings (see http://www.coe.iup.edu/pttut/portfolio/) to web based portfolio management tools that scaffold the user to think about several areas of their portfolio (http://www.career-recruit.fsu.edu/careerportfolio/enter/login.html). At Florida State University, the web-based system is designed as a career based portfolio for all students at the university, rather than a focus on preservice teaching and accompanying reflection.”21

21 Morgret, K. available online at ldt.stanford.edu/~keri/project/main.html
Design Process

Several design processes were combined in the creation of my.STEP.Stanford. These include elements of:

- Learner Centric Design
- Informant Design
- Scenario Based Design
- Human Computer Interaction Considerations

*Learner Centric Design*

“Learner-centered technology design signals a move away from ease-of-use issues and toward the development of a learner's comprehension and expertise.”22 As a result, every attempt was made to fully characterize the learning process that STEP students were experiencing, including the learning goals (such as Teaching Standards) and the current interactions between STEP students, faculty, supervisors, and the cooperating teachers.

*Informant design*

“... to discover what we did not know rather than try to confirm what we thought we knew... the role of informants in the design process, therefore, is multiple – as partners, users and evaluators, designing with and for us.”23

The design process for this project attempted to enlist “informants” to participate in the project.

Although we obtained a tremendous amount of feedback and detailed requirements, in the end it was clear that only one participant could be considered an “informant” in the truest meaning that Scaife had in mind. Not surprisingly, this person was a STEP alum, with more time to “spare” than the current STEP students.

*Scenario Based Design*

In order to have a believable conceptual design, we worked with informants to understand the current process that STEP students experience to develop

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22 http://ldt.stanford.edu/~pagemc/ed229b/learner_centered/soloway.htm, based on Soloway, Guzdial & Hay (1994); see also an LDT compilation of design practices at http://www.stanford.edu/class/educ229b/fall01/design_for_learning/

23 Scaife, Rogers, Aldrich & Davies (1997)
their portfolios. After brainstorming with our informant, a scenario of use was expanded to include what the future could look like. This key scenario, entitled “The Day My Supervisor Observed My Classroom” (see Appendix B), was quite useful, as it:

- Helped to clarify current practices
- Provided a specific example of use with which to “check off” features as they were mocked up
- Focused and prioritized the design process on the mockups that were critical to “telling the story”

**Human Computer Interaction Considerations**

In addition to Learn-ability considerations, several Human Computer Interaction (HCI) principles were used as underpinnings for the design. These included:

- **A Familiar Metaphor** – STEP students have no time to learn new systems, so a “binder” metaphor was deployed. These electronic binders include section tabs and pages
- **Direct Manipulation** – The primary interaction in the design in drag and drop, making it easy for STEP students to “grab” any multimedia object from their desktop and “place” it into their “binder”
- **Visible Affordances** – To make it obvious which elements are active buttons, all the top-level navigation elements, objects, buttons and binder tabs incorporate a rollover glowing swap-image.
Project Plan

Methods

The project will incorporate three phases which overlap and run concurrently. These include:

Investigation Phase
- Building a Team - Recruiting collaborators for the design work and key informants from the STEP program to participate early in the investigation.
- Characterizing and Validating the needs and Learning Problems of the STEP students, including focus group discussions, shadowing and observations

• Brainstorming and mockups with users

(Treena Joi, STEP 2002 @Buchser Middle School)
• Additional Research

This phase made use of the “Hoadley Triangle #1” of Content, Process and Context:
  • Content – What information do STEP students capture in their portfolios? What new evidence can be included, given the new technology affordances?
  • Process – What do STEP students do with their portfolios? How do they create them today? What does personal reflection look like? What scaffolding is provided for metacognition?
  • Context – What characterizes the STEP community? Who do STEP students primarily interact with? What forms of collaboration are in use today?

This phase also utilized “Hoadley Triangle #2”, which is a related evaluation of Tools, Activities, and People.

Sketch Phase
  • Creating storyboards for Scenarios of Use (See Appendix B Scenario)
  • Clarifying requirements and features
  • More mockups; some preliminary working elements
  • More Validation with users

(see sketch mockup online at http://ldt.stanford.edu/~jvanides/eportfolio/mockup-v1/news.htm)

Web Mockup, Final Integration and Field Test Phases
  • Developing the system prototype for the Exhibition
  • Conduct Pilot Learner Studies (currently in progress)
  • Designing and Building the Exhibit
  • Finalizing the Project Documentation and Report
The Team, Collaborators, and Partners

Learning Designers:
- **Jim Vanides** (overall site design; navigation; electronic binder metaphor design; graphics design; reflection affordances, including Teaching Standards worksheets; Gallery design; Community News page design; digital photo annotation concepts)
- **Keri Morgret** (Survey of Current ePortfolio and Peer Review Practices; community affordance design, including STEP directory design; threaded discussion design; invitation manager design; site integration, with html and cosmetic cleanup)

STEP Student Informants:
- Katie Miller (STEP alum)
- Treena Joi (current STEP student, science)
- Kara Mitchell (current STEP student, foreign language)
- Cory Maley (STEP alum)
- Anthony Gallego (STEP alum)
- Kristina Scott (STEP alum)

Design Consulting and Feedback Provided By:
- Stanford LDT Colleagues
- Deb Kim
- Margaret Krebs
- Decker Walker
- Cindy Mazow – Stanford Learning Lab
- Toru Iiyoshi (Carnegie Foundation for the Advancement of Teaching)
- Alan Marcus
- Jo Boaler
- Rachel Lotan

Other Supporters
- Chuck Untulis (HP Labs)
## Project History

<table>
<thead>
<tr>
<th>Time</th>
<th>Description</th>
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<tbody>
<tr>
<td>Fall 2000</td>
<td>“eBinder” project for Human Computer Interaction Course</td>
</tr>
<tr>
<td>Summer 2001</td>
<td>Design Brainstorm - eJournal, MyExploratorium,</td>
</tr>
<tr>
<td>Fall 2001</td>
<td>Design Sketches – handheld assessment helper, early PLA ideas</td>
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<tr>
<td>January 2002</td>
<td>“Portable Learning Assistant” Proposal (v1) - an interactive electronic learning portfolio and a personal web-space for sharing and discussing one's learning. Students and teachers would use a PocketPC (or Palm) to capture images, notes, recordings, or rubric form inputs. This data would be tagged and stored in a database for future reflection and refinement. Learning samples or &quot;performances&quot; could be selectively published to a personal (secured) web-space for review, discussion and feedback. Discussions with Design Advisors</td>
</tr>
<tr>
<td></td>
<td>“Palmtop Portfolio System” (v2-v3) - Keri Morgret joined with Jim Vanides; developed joint todo list and added Keri’s name to proposal v4</td>
</tr>
<tr>
<td>February</td>
<td>“Needs Assessment Phase” Informant Discussions and classroom visits Refinements to proposal</td>
</tr>
<tr>
<td>March</td>
<td>“Design Sketching Phase” Created presentation for design critique; renamed “Learning Portfolio System” 3/2 (SAT) Presented design for review More informant discussions and scenario brainstorm Wrote and expanded scenario description; Generated Numerous pencil sketches of concepts Re-wrote proposal (v7 &amp; v8) to reflect “Electronic Portfolio Workspace” Implementation planning and design discussions; Generated refined pencil sketches; posted as mockup website (v1 &amp; v2)</td>
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<tr>
<td>April</td>
<td>“Web Mockup Phase” Defined navigation framework, artwork; Generated web mockups Defined “Active Learning Ingredients” More planning and design discussions More Informant discussions</td>
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<tr>
<td>May</td>
<td>“Integration and Test Phase” Final Mockup designs Integration and site cleanup Create presentation and exhibit for LDT exposition 5/17 – LEARNING DESIGN AND TECHNOLOGY EXPOSITION White-Paper wrap-up Initial Learner Studies launched</td>
</tr>
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Initial Feedback

In general, the conceptual design has received very positive feedback from potential users (students and faculty). For example:

- “This would be a huge step... puts everything in one place... The time element [of the STEP program] won’t go away, but this gets rid of the busywork of technology...”
- “How do we get people to change [from a paper-based or email way of doing their work]?”
- “This simplifies the whole process...[so they can] spend more time thinking.”
- “This has lots of potential... could build connections between the C&I’s, Supervisors, and Cooperating Teachers...”
- “As an instructor, I’d definitely use it!”
- “The Gallery and incentive structures are a key plus.”
- “The Diary concept is excellent.”
- “How soon can you implement this? Can they use it next year??”

As would be expected, we have also received constructive criticisms and concerns:

- “How do we get people to change [from a paper-based or email way of doing their work]?”
- “It looks like it would save time, but I’m not convinced it would be more meaningful...”
- “Capturing [electronic artifacts] is an essential issue for STEP, but it is not addressed in this system
- “How will you measure its impact on learning?”
- “It’s too complicated.”
- “For the Teaching Standards self-assessment, use the 6 level rubric that is currently in use in the STEP program”
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References


Appendices

Appendix A: Application in Other Learning Settings

Although the focus of this design project is pre-teachers in the Stanford STEP program, the system is clearly usable in many other settings:

- By K12 students and teachers, inside and outside of the school site, for capturing learning and observations in class, during field trips, museum visits, community service, or projects at home
- By K12 administrators to conduct effective professional observations and provide meaningful feedback to teachers
- K12 Teachers who are creating a personal portfolio of their practice as part of National Board Certification
- Higher ed students and teachers in non-education disciplines
- Adult learners engaged in “lifelong learning”, either courses or informal
- Online Learners who want to capture evidence of performance to share with their online compatriots or instructors
- Adult professionals in industry settings where periodical performance reviews can be enhanced with well organized evidence of employee contribution
- Families and clubs, sharing information and “scrapbooks” of experiences
Appendix B: Example Scenario – “The Day My Supervisor Observed My Classroom”

The following scenario was developed with the assistance of our design informant Katie Miller (STEP alum).

1 **PREP** - I send my lesson plan to my supervisor to preview (Today: this often happens at the last minute, and is paper-based)
   1.1 Login to **my.STEP.Stanford** (if pcleand authenticated, personalization is presumed when you go to my.step.stanford.edu)
   1.2 Go to My eBinders and open My C&I eBinder
   1.3 Select the Lesson Planing tab and download the Lesson Plan Word Template (includes handy tips about Teaching Standards)
   1.4 Create Lesson Plan; Save locally, then Drag and Drop it into the My Curriculum Unit eBinder
   1.5 System prompts me for:
      1.5.1 Which tab (section) of the eBinder should it be placed?
           Select “Send to Frog Dissection” tab (selected “new” from drop down list)
      1.5.2 Title, Description
      1.5.3 Do a Mini Reflection on a randomly selected Teaching Standard (self-assessment of which teaching standards are demonstrated in this lesson)
      1.5.4 Invite Feedback (pops up STEP Community Address book and My Buddy List; asks for my invitation preamble...). I invite only my supervisor for now.
   1.6 Supervisor receives email digest that includes invitation to view my lesson plan; email link sends supervisor directly to my Lesson Plan on Frog Dissection

2 **IN CLASS** – My supervisor video-tapes the one hour lesson (Today: this could be as simple as setting up the tripod and letting it run, or could be a thoughtful, hand-held view of some of the lesson, zooming in on interesting interactions and highlights). My supervisor also takes notes to record observations (Today: this is done on a paper form in triplicate. The form includes what happened in one column, and comments/suggestions in a parallel column).

   2.1 My supervisor and I set up a video camera on a tripod to run freely from the back of the room (wide pan). Some day we will use the new 360 degree panoramic video technology that is coming available.
2.2 While the camera runs on its own, my supervisor uses a PocketPC with a portable keyboard to fill in an Observations Record template that was downloaded from the workspace (Word doc, running in Pocket Word).

2.3 My supervisor also periodically removes the camera from the tripod and films handheld to catch some of the interesting interactions between students.

3 **AFTER CLASS** – I meet with my supervisor and cooperating teacher to discuss how the lesson went (Today: the CT is rarely involved in this debrief). I hand my supervisor any additional handouts that were distributed, and we discuss his comments and observations (reflection #1). I leave with the assignment to respond reflectively to my supervisor’s comments, and to watch the video to support further reflection.

3.1 After congratulating me on a splendid class session, my supervisor “beams” the Observation Record page and digital photos from his PocketPC to mine. Then we begin discussing the notes.

3.2 We use the audio recording of the video camera to capture our discussion.

3.3 I leave with the video tape in my hand and the Observation Record in my PocketPC.

3.4 I walk to my car, exhausted.

4 **GOING TO STEP** – I’m thinking about the experience while I’m driving home. Before it all becomes a blur, I record some audio notes while I drive, using my PocketPC (reflection #2).

5 **AT STEP LAB** – I watch the video, “crying and crying”, while it is imported into iMovie. I make a few time-code notes of possible “clips” to share in small group discussions or save for my portfolio (reflection #3). After the video is saved as an iMovie, I use my audio notes, supervisor comments, and my fresh viewing of the video to decide which video clips are the most informative from the day. I edit the iMovie (reflection #4) and export it as a QuickTime movie. While it’s compiling, I write my reflection response to my supervisor (reflection #5) by appending the document in my PocketPC.

6 **My Curriculum Unit eBinder** – I upload my experiences from class.

6.1 Drag and drop my Audio notes (to “Private Reflections” area of the Frog Dissection section) onto the “transcribe” button. The audio file is transcribed by a server-side version of Dragon Naturally Speaking, using my personal voice profile. It returns a transcription and the audio file into my private diary and the private reflections section of the Frog Dissection lesson plan.
6.2 I drag and drop my response to my supervisor’s notes into the Electronic Artifacts area of the Frog Dissection section and invite my supervisor to comment. I am prompted to describe the artifact (title, description) and can invite my supervisor at the same time. There is space for a private reflection, too, that will be associated with that artifact’s info page.

6.3 I drag and drop my selected video clips into my eBinder. Again, I am prompted to describe the artifact (title, description) and can invite my supervisor at the same time. There is space for a private reflection, too, that will be associated with that artifact’s info page.

6.4 My supervisor receives an email invitation to comment on my eBinder entry (my response to his notes). I receive an alert (“You’ve got a response”) two days later with my supervisor’s responses and further questions. After one more exchange (reflection #6), my supervisor approves my reflection and “collection of evidence” for inclusion in my ePortfolio.

6.5 I select the checkbox next to the Observation Notes artifact and pull down the “send copy to…” command, specifying the destination as the Evaluations and Responses section of my ePortfolio. I also change the privacy settings so others can see this portion of my ePortfolio.

7  **@ Supervisory Group Meeting** – During our next supervisory meeting, my supervisor asks if I would be willing to share my video case with the other STEP students in our advisory team. I project the video for them to see and we discuss the case as a small group. This generates more ideas for next time (reflection #7), and builds our shared library of practical suggestions. We save the suggestions into a shared (green) eBinder called Our Supervisory Pearls of Wisdom. We also plan the next STEP social outing that our group is hosting, and we post an invitation on the online STEP social calendar.