Using e-Portfolios at Penn State to Enhance Student Learning
Status, Prospects, and Strategies

23 February 2002

David DiBiase
e-Education Institute

With contributions by

Carla Zembal-Saul
Department of Curriculum and Instruction

Jeannette Sabre
Department of English

David Howard
e-Education Institute

Hank Rademacher
e-Education Institute

Philip Burlingame
Division of Student Affairs

Gene Melander
Center for the Study of Higher Education

Joe Schall
College of Earth and Mineral Sciences

Eric Spielvogel
e-Education Institute

Jonathan Mathews
Department of Energy and GeoEnvironmental Engineering

Robert Orndorff
Office of Career Services
Executive Summary ................................................................................................................ 3
Introduction .......................................................................................................................... 6
I. What is a “Student Learning e-Portfolio”? .................................................................... 6
   A. Portfolios ..................................................................................................................... 6
   B. Electronic Portfolios ............................................................................................... 7
   C. The Process of e-Portfolio Development ............................................................... 8
   D. Potential benefits ..................................................................................................... 8
      1. Benefits to students ............................................................................................. 9
      2. Benefits to faculty members ............................................................................. 10
      3. Benefits to institutions ...................................................................................... 10
   E. Potential costs, obstacles, and challenges ............................................................. 11
II. How Prevalent are Student e-Portfolios at Penn State? ............................................ 13
   A. Personal Web Space Usage Survey ...................................................................... 14
   B. Profiles of Selected e-Portfolio Initiatives at Penn State ....................................... 16
      1. Web-Based Portfolios in Elementary Teacher Education................................. 16
      2. Student Course and Program Portfolios in Geographic Information Science .. 21
      3. Student Professional Web Portfolios in English................................................. 23
      4. Student Course Portfolios in Energy and GeoEnvironmental Engineering..... 25
      5. Student Course Portfolios in Teaching English as a Second Language ...... 25
      7. Teaching With Technology and Web Professional Certificate Programs ...... 30
      8. Division of Student Affairs ............................................................................. 31
      9. eLion ................................................................................................................. 31
III. What’s Going On at Other Institutions? ..................................................................... 32
   A. Profiles of Exemplary Projects ............................................................................ 32
      1. Alverno College ................................................................................................ 32
      2. Kalamazoo College ........................................................................................... 33
      3. Stanford University ........................................................................................... 34
      5. University of Iowa ............................................................................................ 36
      6. University of Minnesota ...................................................................................... 36
      7. e-Portfolio Consortium ..................................................................................... 36
IV. Conclusion and Recommendations .............................................................................. 37
V. Model Proposal for e-Portfolio Development Course .............................................. 40
VI. References and Suggested Readings .......................................................................... 46
Executive Summary

“Student learning e-portfolios” are personalized, Web-based collections of selected coursework, artifacts of co-curricular activities, and (ideally) students’ reflective commentary. Insofar as it fosters a reflective approach to learning, the process of e-portfolio development encourages students to become more actively involved in planning, and more responsible for achieving, their own educational goals. Students also stand to gain by sharing examples of their work with potential employers, by mastering transferable information technology skills, and by demonstrating knowledge gained beyond the classroom. Student e-portfolios also offer potential benefits to faculty members, institutions, and society by fostering increased student motivation, by enriching student advising, and by disclosing authentic evidence of learning outcomes.

The core technological infrastructure required to provide every Penn State student with the opportunity to create an e-portfolio already exists, in the form of the Personal Web space accounts offered to students at no charge by the University’s Center for Academic Computing. Few parallel institutions offer comparable student access to personal Web publishing, although several institutions (including two CIC institutions) have initiated campus-wide, career-oriented, voluntary e-portfolio programs. Although no system-wide student e-portfolio initiative has been proposed at Penn State, several individual or small group initiatives in various academic units have demonstrated encouraging results.

Successful local initiatives notwithstanding, Penn State’s personal student Web space accounts continue to be underused. Fewer than four in ten students have activated their free Web space account, and fewer than one in ten have published examples of their academic work on-line. These low rates of student participation are associated with paradoxical faculty expectations; although nine out of ten Penn State instructors expect students to use the Web to access information, fewer than one in ten instructors expect students to actually “publish” Web-based information themselves.

To encourage instructors to refine their expectations about how the Web can contribute to learning, the University needs to create pedagogical and support infrastructures that complement the existing technological infrastructure. Compelling exemplars of student e-portfolios are needed, as well as the tutorials students and instructors need to develop the requisite skills. Many of the necessary resources already exist, but not in a place and in a form that prospective student e-portfolio developers and instructors are likely to find useful. Once these resources are in place, instructors need to be encouraged to incorporate e-portfolio-related assignments in their courses, and to recruit undergraduate student teaching interns to provide the technical support that a diminishing but still substantial minority of students need to master rudimentary Web publishing skills.

In the near term, the Center for Education Technology Services (CETS) and Center for Academic Computing (CAC) can help by hosting and cooperating in the development of a new, centrally maintained Web site for e-portfolio developers (“portfolio.psu.edu”) that includes the following features:

http://www.e-education.psu.edu/portfolios/e-port_report.shtml
1) A new default home page for Personal Web space accounts that includes a link to portfolio.psu.edu.

2) A gallery of best practices in student e-portfolios (including WebFair award winners)

3) An on-line tutorial and self-assessments on how to create an effective resume (The resume tutorial and resume generator authored by Joe Schall and David Howard as part of the e-Education Institute’s VITAE system are good starting points, as are materials maintained by the Office of Career Services.)

4) An on-line tutorial and self-assessments on file management (including file naming and uploading, and incorporating ongoing improvements to CAC’s Penn State Access Storage Server system).

5) A set of on-line tutorials and self-assessments on how to capture evidence in digital formats that are compatible with Web browsers.

6) A set of on-line tutorials and self-assessments on reflective writing.

7) A set of on-line tutorials and self-assessments on privacy and free speech.

Although some of these resources already exist, they are not consolidated in one location that is linked to the default home pages in students’ Personal Web space accounts. Thus, instructors and students who need these resources may not find them.

Some of the ways in which academic units might help address these needs include:

1) Encourage First-Year Seminar instructors to require students to activate their Personal Web space accounts, to develop resumes, and to link their resumes to their personal home pages.

2) Develop and offer practicum courses in professional e-portfolio development for second-, third-, and fourth-year students. Properly conducted and promoted, such courses may help convince instructors in other courses that students have what it takes to fulfill Web publishing assignments. (A model course proposal developed by the College of Earth and Mineral Sciences, in collaboration with the Office of Career Services, follows as an appendix to this report.)

3) Encourage instructors to request Technology Learning Assistants (http://cac.psu.edu/tla) to help instructors develop and test e-portfolio-related assignments, and to recruit undergraduate Teaching Interns to provide peer technical support.

4) Encourage academic advisors to consult advisees’ Personal Web space accounts, and to advise that students use their accounts to document and reflect upon their university experiences.
In the longer term, we believe that CETS and CAC, in collaboration with other interested institutions, should develop an “e-portfolio learning system” that supports students in planning, constructing, managing, assessing, and reporting their learning. The e-portfolio learning system’s role in supporting student learning would be analogous to the role that the ANGEL course management system plays in supporting faculty teaching. The e-Portfolio Consortium (see Section III.7, page 34) might be the most likely place to develop inter-institutional collaborations needed to produce such a system.

We believe that the near-term and long-term actions outlined above, combined with an energetic and sustained promotional effort, will enable Penn State students to 1) capture examples of their learning, 2) reflect upon what they have learned and adjust their learning paths, and 3) demonstrate what they have learned throughout their university careers in forms they can easily and effectively share with instructors, fellow students, family members, potential employers, and others.
Introduction

The e-Education Institute of Penn State’s College of Earth and Mineral Sciences (EMS) hosted semimonthly seminars on portfolio assessment during the Fall semesters of 2000 and 2001. This report summarizes the findings of those seminars, and recommends actions needed to provide every Penn State student, in the College of EMS and elsewhere, with the opportunity to create an e-portfolio as a means to plan and showcase his or her university career.

The intended audience for the report includes the Vice Provost and Dean for Undergraduate Education, who provided crucial encouragement and financial support; members of Penn State’s e-Education Council, Web Strategies Implementation Team and Teaching and Learning Consortium, as well as the e-Portfolio Consortium, whose member institutions include Indiana University–Purdue University at Indianapolis, The University of California at Los Angeles, and The Pennsylvania State University. Primarily, however, the report addresses Penn State faculty members considering whether to assign portfolio-related activities in their classes, as well as staff members of the Center for Academic Computing who are best positioned to provide tools to help students and instructors to use e-portfolios to their fullest potential.

I. What is a “Student Learning e-Portfolio”?

A. Portfolios

The term “portfolio” means different things to different people. Dictionary definitions include references to containers used by artists and architects to transport drawings and plans, to the securities held by an investor, and to the office and functions of a government minister or cabinet member. In the context of contemporary higher education, the term denotes collections of evidence assembled by students, faculty members, or entire institutions to enhance the effectiveness of teaching and learning, to assess learning effectiveness, and to demonstrate competence to external stakeholders.

Several types of academic portfolios have received attention in the literature and among educators at Penn State, including:

- **Student learning portfolios** are purposeful collections of examples of student work annotated (ideally) with students’ reflective commentary. Examples may be drawn from assignments associated with a single course, or from curricular and co-curricular activities spanning a student’s entire academic career. Students may also assemble portfolios as a way to earn academic credit for learning accomplished outside the classroom (Linn and Gronlund 2000, Yancey 2001a).

- **Teaching portfolios** consist of course syllabi, assignments, student work, and other artifacts, collected by practicing or aspiring teachers with the intent of fostering self-
reflection and peer review of teaching. Like learning portfolios, teaching portfolios may be comprehensive or they may focus upon individual courses (Hutchings 1998).

- **Institutional portfolios** “contain examples of [an] institution’s activities, programs, and initiatives, each expressing an element of reflection and self-assessment. Through its portfolio, an institution documents how it is achieving its stated mission by examples that speak to the interests of various audiences” (Ketcheson 2001, p. 84).

Consistent with the goals and content of the 2000 and 2001 e-Education Seminars, this report focuses upon student learning portfolios.

**B. Electronic Portfolios**

“Electronic” portfolios (e-portfolios) are digitized collections assembled in World Wide Web sites or recorded media such as CD-ROM. Yancey (2001a, p. 28) points out that “the electronic medium is particularly suited to two needs of portfolio users. First it provides a place to house students’ work. And second, through hyperlinking, it invites students to make connections between and among classes, experiences, and observations.”

Pages from a student e-portfolio by Scott McAllister, Penn State senior majoring in Chemical Engineering, created in English 202C under the supervision of instructor Jeanette Sabre. Scott’s home page is shown upper left. Upper right is a “dynamic” resume, in which courses titles are linked to subsidiary pages that
C. The Process of e-Portfolio Development

The potential benefits of e-portfolios (outlined below) have more to do with the process of e-portfolio development than with the portfolio product itself. According to Danielson and Abrutyn (1997, cited in Barrett 2001a), portfolio development involves five stages:

1) **Collection** Teachers and students learn to save artifacts that represent the successes (and “growth opportunities”) in their day-to-day teaching and learning.

2) **Selection** Teachers and students review and evaluate the artifacts they have saved, and identify those that demonstrate achievement of specific standards.

3) **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.

4) **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.

5) **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.

To the extent that it fosters a reflective approach to learning, the process of e-portfolio development encourages students to become more actively involved in planning, and more responsible for achieving, their own educational goals. It is important to keep in mind, however, that the mere act of compiling a portfolio does not ensure that substantive reflection and learning will take place. “Links [hyperlinks],” Yancey (2001a, p. 29) reminds us, “do not equal reflection … reflection itself—what it is, how we ask for it, and how we respond—seems to be a major challenge.”

D. Potential benefits

The outlines below include categories of potential benefits and disadvantages identified by Huba and Freed (2000) and Linn and Gronlund (2000), as well as by participants in Penn State’s e-Education Seminar.
1. Benefits to students

- **Opportunities for increased learning effectiveness** Learning takes place within complex psychological and sociological milieus. The number of interacting variables involved makes it extremely difficult to measure meaningful learning objectively. Like other proposed educational innovations, proponents’ claims that e-portfolios offer the potential to enrich teaching and learning rest primarily on assumptions, participant observation, and force of argument, rather than on results of controlled experimentation. The key assumption related to student learning e-portfolios is that they provide opportunities to increase student engagement, and that “the engaged learner, one who records and interprets and evaluates his or her own learning, is the best learner” (Yancey 2001b, p. 83). Evidence from earlier experimentation in computer-aided instruction supports the assumption. In a review of the impact of multimedia software on learning, for example, Hutchings and associates (1992, p. 171) found that “…most learning seemed to occur with those who had prepared the course material rather than those who received it.” This conclusion is consistent with constructivist theory, which argues that learners actively construct their own knowledge rather than simply receive it from instructors, authors, or other sources (Jonassen 1991; Dana and Tippins 1998). It also coincides with the goals of the active learning component of Penn State’s general education program.

- **Opportunities to model professionalism** Transcripts of courses taken and letter grades earned, along with resumes that outline achievements and qualifications, are obviously useful as summative lists of accomplishments. However, these documents fail to convey the extent to which Penn State students possess the knowledge, skills, and dispositions that employers need. e-Portfolios enable students to share authentic examples of their academic work and co-curricular activities with potential employers, family members, and other stakeholders. Equally important, the e-portfolio development process provides students with opportunities to reconsider career goals in light of their own reflections and others’ responses, and to revise their goals proactively.

- **Opportunities to enhance information technology skills** Depending on how it is implemented, the process of e-portfolio development can require students to develop transferable skills. Required skills may include the ability to produce and save documents in appropriate digital formats, to code HTML directly or to edit it indirectly using specialized software, to capture and process digital imagery and video using specialized hardware and software, and to upload digital files to Web servers. Such skills contribute to students’ ability to use information technologies effectively throughout their academic careers and beyond.

- **Opportunities to gain academic credit for learning beyond the classroom** In its recent policy 42-97, Penn State’s Faculty Senate has empowered academic units to award academic credit to students “who can demonstrate college-level learning acquired in a non-collegiate setting (such as work experience, a training program, or a
hobby)” (Penn State Faculty Senate 2000). Portfolios are expected to contain “a combination of documents and information that provides evidence of mastery of specific course requirements.” The on-line Certificate Program in Geographic Information Systems offered by Penn State’s Department of Geography through the University’s World Campus relies upon e-portfolios to evaluate the knowledge and skills of hundreds of students enrolled across North America.

2. Benefits to faculty members

- **Opportunities to leverage student motivation** Penn State instructors who have required or encouraged students to “publish” their work on-line report that many students enthusiastically embrace opportunities to develop and use information technology skills. Such students are likely to devote more and better effort to such assignments than they otherwise might.

- **Opportunities to align objectives and evaluation strategies** By providing visible evidence of student achievement, e-portfolios offer great promise as a means to assess the effectiveness of individual classes as well as entire academic programs. This potential can only be fulfilled, however, if faculty members specify in advance, and in detail, what students should know and be able to do after successful completion of a class or program, and if assessment and evaluation strategies are properly aligned with the specified learning objectives. The introduction of an e-portfolio assignment therefore provides an impetus for individual faculty members and entire faculties to reflect upon the mission and goals of their courses and programs, and to specify assignments that are likely to help students achieve goals.

- **Opportunities for more fruitful advising** One of the most ambitious student portfolio initiatives among U.S. higher education institutions, the so-called “K Plan” adopted by Kalamazoo College, was specifically designed as a means to enrich academic advising. According to program consultant Emily Springfield, many (but certainly not all) advisors recognized that student portfolios afforded the potential to facilitate “deeper discussion of students’ goals and choices” than they typically experienced (Springfield 2001, p. 55).

- **Opportunities to more efficiently manage student deliverables in distance courses** Instructors whose classes are mediated entirely through the World Wide Web face many challenges, not the least of which involves organizing incoming student assignments. E-portfolios enable students to accept responsibility for organizing assignments themselves.

3. Benefits to institutions

- **Opportunities to respond to calls for greater accountability and outcomes-based accreditation** U.S. higher education institutions face unprecedented expectations for
openness and accountability by the public as well as state and federal government agencies. At the same time, the organizations that accredit such institutions have begun to insist that institutions demonstrate in more measurable ways that their graduates possess the competencies needed to succeed in their chosen professions. Student e-portfolios offer the potential to enable students to demonstrate in their own words, and with the products of their own efforts, the value and effectiveness of their educational experiences.

- **Transportability of credits** Like students, institutions have an interest in ensuring the transportability of academic credits in an increasing mobile society. Many institutions also wish to foster lifelong relationships with students, some of whom seek to earn academic credit for accomplishments outside of the classroom. By providing opportunities for students from varied backgrounds to demonstrate their knowledge, skills, and dispositions, e-portfolios promise to help institutions respond with greater agility to the needs of their increasingly diverse clientele.

E. Potential costs, obstacles, and challenges

- **e-Portfolios are time consuming to create, maintain, and evaluate** Linn and Gronlund (2000, p. 312) point out that portfolios tend to be “labor intensive for the teacher—requiring considerable time in planning, monitoring, and providing feedback to students.” They cite one representative case in which 815 person hours were required to score 1250 portfolios produced by middle school and high school students in Pittsburgh, Pennsylvania. Penn State students who have participated in e-portfolio-related assignments—particularly students without previous Web publishing experience—confirm that such assignments are labor intensive for them as well.

- **e-Portfolios are difficult to evaluate reliably** Linn and Gronlund (2000) also point to research that demonstrates the difficulty of scoring portfolios. Studying the effectiveness of a statewide portfolio assessment initiative for Vermont 4th- and 8th-graders, for instance, researchers found that ratings of the same student work by different raters were unacceptably inconsistent. Other studies suggest that acceptable reliability can be achieved, however, “with sufficient planning, specification of portfolio guidelines, refinement of scoring procedures, and rater training” (Linn and Gronlund 2000, p. 302).

- **Unequal access to technology and skills** The most recent (Spring 2001) FACAC survey data indicate that 96 percent of Penn State students own personal computers, and 67 percent report that they are “skilled or very skilled” in the use of information technology. The fact that one-third of survey respondents considered themselves less than skilled indicates that instructors who assign e-portfolio-related projects must provide technical support services adequate to assist a substantial minority of their students. Instructors who do not possess Web publishing skills themselves are
naturally reluctant to adopt such assignments. Undergraduate student teaching internships, through which experienced volunteers provide technical support to peers during evening office hours in public computing facilities, may be the most efficient means to provide the needed support.

- **Cyber-plagiarism** Penn State instructors and students are concerned that “publishing” student academic work on-line increases the risk of cyber-plagiarism. Although it does not identify the availability of student work on-line as a contributing factor, a 1996 “Pulse” survey (Office of Student Affairs 1996a) estimates that almost one-quarter of Penn State students cheat on tests, and about forty percent cheat on class assignments. The availability of students’ assignments in e-portfolios will increase the number of sources of on-line material from which students may be tempted to copy illicitly. However, a variety of Web-based tools, ranging from ordinary search engines to specialized programs for detecting plagiarism, now make it easier to identify text passages copied from on-line sources than similar passages copied from sources available only as printed text (for example, see list of resources at http://www.psu.edu/celt/ntlf/v9n4/web.htm). Center for Education Technology Services Senior Director John Harwood predicts that technological approaches alone are unlikely to ensure academic integrity, however (Neil 2001).

- **Privacy** The results of another 1996 “Pulse” survey (Office of Student Affairs 1996b) of 87 Penn State students suggest that although few students have ever experienced an incident in which personal information was improperly revealed (3.4 percent of respondents), one in four students is opposed to having information about themselves available on-line.

The Family Educational Rights and Privacy Act (FERPA) of 1974 protects the privacy of U.S. students’ education records. Every college and university receiving federal funds in the United States is subject to FERPA regulation. With few exceptions, the law prohibits the disclosure of any student record without the advance written permission of the student. Colleges and universities also must annually notify students about the student ‘directory information’ that will generally be released to the public. This directory information may include the student’s name, address, major, telephone number, email address and other basic information. Instructors must use care not to publish any personal information about a student that is in violation of FERPA. Any student has the right under FERPA to suppress all personal information from public disclosure. Also, some student information, such as social security numbers, grades, test scores, a student’s race, ethnicity or gender, cannot legally be listed as ‘directory information’ and can therefore never be publicly disclosed by an instructor. The US Department of Education’s Family Compliance Office has published the definitive Web resource about FERPA at http://www.ed.gov/offices/OM/fpco/index.html. Penn State’s Registrar’s Office also provides a resource page about student privacy and the University’s official listing of what student records are considered ‘directory information’ at http://www.psu.edu/registrar/conf.html.
Students should also be cautioned about disclosing their own personal information. Warning that “there is no true privacy on the Internet unless you encrypt it yourself,” Gerry Santoro, Lead Research Programmer in Computer and Information Systems and Assistant Professor of IST, suggests that students should understand the risks before listing any personal information in on-line portfolios. Harassing telephone calls and email messages or even more dangerous criminal activity such as identity theft or stalking can be the result of too much disclosure. The Federal Trade Commission recently reported that the number of complaints about identity theft in 2001 was approximately 204,000, or 42 percent of all consumer fraud complaints received last year (Krebs 2002).

- **Free speech** At the November 12 session of the 2001 e-Education Seminar, Professor Santoro pointed out that while students believe that it is guaranteed absolutely by the First Amendment to the U.S. Constitution, free speech is in fact not entirely free. Slander, libel, and harassment are all illegal. At Penn State, neither email nor Web usage are monitored, but officials do respond to complaints. Censorship criteria are purposefully broad and ambiguous. The events of September 11, 2001, have resulted in increased scrutiny by law enforcement agencies and concerned individuals and groups. Santoro suggests that instructors who assign e-portfolio-related activities should advise students about risks associated with free speech, including complaints, litigation, or even physical retaliation by offended individuals and groups, and increased scrutiny, censorship, harassment, and arrest by authorities. Furthermore, he suggests that instructors should avoid assigning projects that might lure students into expressing controversial viewpoints.

**II. How Prevalent are Student e-Portfolios at Penn State?**

Wright and colleagues (1999) observed that despite their potential, programmatic student learning portfolios (those that portray entire student careers) are rare in higher education. This observation certainly holds true at Penn State.

A November 2000 FACAC Survey of Faculty and Teaching Assistants revealed that only seven percent of Penn State instructors expect their students to create Web pages, despite the fact that over 90 percent expect students to use the Web for research and communication (p. 2). This finding suggests that the percentage of Penn State students who have “published” examples of their academic work on-line is likely to be small. The data reported in this section confirm that expectation: as of December 2001, fewer than ten percent of Penn State undergraduates (at University Park and other campuses) had published examples of their academic work in the Personal Web space accounts. Rates of student Web publishing activity appear to vary considerably among academic units,
however; in the College of EMS, for instance, nearly 50 percent of students have “published” academic work on-line.

This section summarizes results of a survey of Personal Web space usage among Penn State students, and profiles courses and units that have implemented, or are planning to implement, e-portfolio initiatives.

A. Personal Web Space Usage Survey

Since Fall 1996, the University’s Center for Academic Computing has offered every student a free Web space account (see http://www.personal.psu.edu). Initially accounts included 2 Mb of free disk space. The standard disk quota was later increased to 50 Mb. These Personal Web space accounts are the most likely places for students to develop and broadcast e-portfolios.

Twice a year since the Fall of 2000, the e-Education Institute has systematically surveyed undergraduate students’ Web space accounts. The purpose of this ongoing semiannual survey is to gauge the extent to which these accounts are being used to enrich undergraduate education in the College of Earth and Mineral Sciences, and throughout the University. The following table lists the three student populations surveyed in December 2001.

<table>
<thead>
<tr>
<th>Survey Samples and Populations, December 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS Majors at University Park</td>
</tr>
<tr>
<td>Other Majors at University Park</td>
</tr>
<tr>
<td>Undergraduates at Other Penn State Campuses</td>
</tr>
</tbody>
</table>

In December 2001, the survey team selected 100 Web space accounts at random from each of three populations: University Park undergraduates majoring in a program affiliated with the College of Earth and Mineral Sciences, other University Park undergraduates, and undergraduates at all other Penn State campuses. (Students who were ineligible for Web space accounts were eliminated from the target populations.) e-Education Institute staff member Eric Spielvogel then visited every one of the 300
randomly selected accounts, and recorded whether or not the account had been activated, and if so, how it was being used.

### Web Space Activation Rates by Undergraduate Students, December 2001

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS Majors at University Park</td>
<td>63 percent (63 of 100)</td>
</tr>
<tr>
<td>Other Majors at University Park</td>
<td>37 percent (37 of 100)</td>
</tr>
<tr>
<td>Undergraduates at Other Penn State Campuses</td>
<td>20 percent (20 of 100)</td>
</tr>
</tbody>
</table>

In general, Personal Web space accounts are underused by Penn State undergraduates. Activation rates vary substantially among the different populations, however. While over six in ten EMS undergraduates sampled had activated their accounts, fewer than four in ten University Park undergraduates in other majors, and only two in ten of sampled undergraduates at campuses other than University Park, had activated theirs.

Free Web space accounts are available to students from off-campus vendors, of course, but it can be argued that few students use off-campus Web space accounts as opposed to Penn State accounts. Spielvogel used google.com to search for Personal Web space accounts for the 63 non-EMS University Park undergraduates who had not activated their Penn State accounts. Only two students (3 percent) had published material in off-campus Web space accounts.

### Academic Web Publishing by Penn State Undergraduates, December 2001

<table>
<thead>
<tr>
<th>Category</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>EMS Majors at University Park</td>
<td>47 percent (47 of 100)</td>
</tr>
<tr>
<td>Other Majors at University Park</td>
<td>8 percent (8 of 100)</td>
</tr>
<tr>
<td>Undergraduates at Other Penn State Campuses</td>
<td>9 percent (9 of 100)</td>
</tr>
</tbody>
</table>

Fewer than one in ten undergraduates at University Park has posted examples of his or her academic work on-line. The low rate appears to be associated with
instructors’ low expectations. As pointed out above, data produced by Penn State’s Center for Education Technology supports this hypothesis: according to the FACAC Survey of Faculty and Teaching Assistants, November 2000 (p. 2), only seven percent of instructors expect their students to create Web pages, despite the fact that over 90 percent expect students to use the Web for research and communication.

EMS majors are more likely than other Penn State undergraduates to post academic work on-line. Nearly half of EMS student accounts sampled contained examples of academic projects, compared to less than ten percent for other Penn State majors. The higher rate among EMS students seems to be explained by different faculty expectations. As reported below, the EMS First-Year Seminar incorporated a Web publishing assignment in Fall 2001, and several courses offered by the Department of Geography (GEOG 121, 321, 352 and 357), Energy and GeoEnvironmental Engineering (EGEE 101), and Meteorology require or encourage students to publish assignments on-line. Almost 40 percent of the College’s student Web publishing activity can be traced to one general education course, Geography 121. This suggests that increased faculty expectations in even a few large-enrollment courses can have a substantial impact in encouraging students to play more active roles in planning and portraying their academic careers in on-line forms.

B. Profiles of Selected e-Portfolio Initiatives at Penn State

Although no coordinated, system-wide e-portfolio initiative has been undertaken at Penn State, individual initiatives have been implemented or proposed within several academic and administrative units, including the College of Education, the College of Earth and Mineral Sciences, the College of Liberal Arts, the School of Information Sciences and Technology, the Division of Undergraduate Studies, the Schreyer Honors College and the Division of Student Affairs. Nine e-portfolio initiatives featured during the 2000 and 2001 e-Education Seminar are profiled in this section.

1. Web-Based Portfolios in Elementary Teacher Education

Carla Zembal-Saul, Tom Dana, and colleagues in the Department of Curriculum and Instruction engage prospective elementary teachers in the development of Web-based teaching portfolios for the purposes of (a) making their personal theories about learning and teaching explicit, (b) critically reflecting on and re-evaluating those theories in light of experiences (e.g., coursework, field experiences), and (c) providing documentation of teacher performance vis-à-vis instructors’ conceptual framework.

The prospective teachers engaged in this project are elementary education majors enrolled in a block of subject-specific pedagogy courses and a concurrent field experience taken during the last semester prior to student teaching. Approximately 400 prospective teachers participate each year.
At the outset of the project in Spring 1998, Zembal-Saul and colleagues provided prospective teachers with electronic templates to structure their selection of artifacts around planning, teaching and reflection. Prospective teachers authored their portfolios using HyperStudio™ and then recorded the portfolios on CD-ROM disks. Analysis of these portfolios indicated that they had the potential to support thoughtful reflection (Zembal-Saul 1998), but a different approach seemed to be needed to assist prospective teachers in developing a more explicit pedagogical framework that reflected key considerations for supporting children’s science learning as explicated in our conceptual framework.

In the Summer of 1998, Zembal-Saul and colleagues moved from the private HyperStudio™ format to a more public, Web-based product. They presented prospective teachers with the portfolio task of demonstrating their understanding of and ability to support children’s science learning. No structured guidelines were provided, however. Analysis of these Web-based portfolios indicated that it was possible to differentiate among prospective teachers based on the representations in their portfolios (Zembal-Saul, Dana, Severs & Boardman 1999). Moreover, results of the analysis supported the findings of other studies on teaching portfolios, in that portfolio development can provide an effective vehicle for documenting and examining teachers’ emerging understanding of subject-specific pedagogy.

As a result of these efforts, Zembal-Saul and colleagues developed a new portfolio task that encouraged prospective teachers to make better use of the hyperlinking and multimedia capabilities of hypermedia authoring. Thus, in Fall 1998 and Spring 1999, the prospective elementary teachers organized their portfolios around the conceptual framework for the Elementary and Kindergarten Education Program at Penn State. Throughout the semester, they collected, evaluated, and selected evidence (e.g., reading reflections, course projects) for the purpose of demonstrating their understanding, abilities and dispositions associated with various performances embedded in the Penn State framework. Analysis of these portfolios suggested that this Web-based task indeed supported teachers in reflecting on relationships among university coursework, field experiences, and their developing personal theories about how children learn science and the role of teachers in supporting that learning. With only minor modification, this portfolio task continues today.

**Project Components**

The portfolio task requires prospective elementary teachers to collect, evaluate and synthesize evidence to justify their developing pedagogical theories in light of new experiences and learning. The hypermedia authoring aspect of the project provides prospective teachers with a way to (a) create and revise multidimensional representations of learning and teaching, and (b) support flexible and non-linear thinking about relationships between personal pedagogical theories, university coursework, and field experiences. The project provides faculty members and the program with data concerning
teacher performance and the kind of impact teacher education interventions such as coursework and field experiences have on that performance.

In its current version, the Penn State Web-based portfolio project is organized around three main components: (a) a collection of evidence, (b) an evidence-based philosophy of science teaching and learning, and (c) a program outcomes performance area for demonstrating knowledge, skills, and dispositions. Each component of the portfolio is designed to address a particular purpose. For instance, the collection area is portrayed as a place for prospective teachers to store their growing collection of evidence throughout the semester. Beginning during the first week of the course, prospective teachers learn basic Web development and multimedia skills and are required to post course assignments and other potential sources of evidence to the collection area. The development of the collection area encourages prospective teachers to post their work in the course early and often, promoting ongoing technological skill development.

Information provided to students and portfolio examples are available for review at http://www.ed.psu.edu/ci/EKEDPortfolio/portfolio.html

The initial version of the Web-based philosophy is developed early. The purpose is to get prospective teachers to begin to articulate their personal theories of teaching and learning as a series of claims. Evidence for these initial philosophy statements often includes vivid portrayals of personal K-15 experiences learning science. Zembal-Saul and colleagues require all evidence to be justified in light of the claim about teaching and learning that is being made. As the semester progresses, prospective teachers revise their philosophy statements several times after careful consideration of programmatic experiences. Prospective teachers can change their philosophy statements in one or more of the following ways: (a) keep original claim about teaching and learning with additional sources of evidence; (b) modify an existing claim in light of new evidence; (c) develop a new claim in light of new evidence; or (d) abandon a claim due to lack of compelling evidence.

Finally, the Performance area of the portfolio is intended to encourage prospective teachers to reflect on the knowledge, abilities, and dispositions that are deemed by Elementary and Kindergarten Education Program as important, and the potential connections among program outcomes and their experiences in courses and field experiences.

As one might expect, a great deal of assistance is required to help prospective elementary teachers engage in such an activity. The Science Education Program, Department of Curriculum and Instruction, and the College of Education have strongly supported this project through technological and human resources since its inception. As elementary education majors do not necessarily think in terms of claims, evidence, and justification, this way of thinking and reflecting is modeled within courses. The addition of “portfolio discussions” (some of which occur in a Web-based discussion forum), in which
prospective teachers review evaluate portfolio evidence in relation to claims about teaching and learning science, also has been useful.

**Project Outcomes**

Project participants have come to see portfolio development as the construction of an integrated, coherent, evidence-based argument in which prospective teachers justify their assertions about supporting children’s (science) learning. Engaging in such an activity requires one to reflect in substantive ways on individual pieces of evidence, consider relationships among them, and compare them to personal theories about teaching and learning. **Although project coordinators note that it is difficult to move some elementary education majors beyond describing discrete pieces of evidence to using related pieces of evidence to justify claims, they also observe many benefits.**

The Web-based portfolio project has allowed the project team to find an innovative use of hypermedia and Web technology to support teacher learning. Ms. D., a recent Web-based portfolio developer, commented that the philosophy task in the hypermedia environment allowed her to focus on the substance of her ideas rather than the attractiveness of the portfolio. In comparing this Web-based portfolio project to other portfolios she developed for teacher education courses, she indicated that she immediately recognized that the packaging was not as important as the content and organization of the portfolio. As she saw it, the technology tool made it easy to make the portfolio look good with just a few points and clicks and forced her to think about how she wished to organize her evidence and justifications to support her claims about teaching and learning.

Ms. J., another recent student, learned to clarify her thinking about teaching through the iterations of her Web-based philosophy. As with many of the teachers who have participated in this project, the initial efforts reflect a very generalized view of teaching. Yet, through ongoing conversations about and reflection on the emerging claims, evidence, and justifications, prospective teachers completing these Web-based portfolios seem to be better able to articulate their ideas about important aspects of teacher knowledge, such as ways of working with diverse children.
Another outcome seems related to technology use in general. **Prospective teachers appear to overcome some technology anxiety and build confidence in their use of computer and multimedia technology.** In the past year, many more prospective teachers were observed using applications of technology with children in their field placement classrooms, especially multimedia technologies. Several of the prospective teachers in the Spring 2001 cohort, for example, worked with their mentor teachers and school children to develop Web sites for their classrooms.

Lastly, the Elementary and Kindergarten Education Program has benefited from this project. Faculty members have a clearer idea of what prospective teachers are able to
document from their learning in classes and field experiences. That knowledge helps
guide course instructors in modifying assignments and tasks to help provide richer
opportunities to learn. The project appears also to have contributed to the effectiveness of
the College of Education’s mission to prepare the next generation of teacher educators by
immersing many future teacher educators in thinking in a more scholarly way about what
outcomes/performances are expected for future teachers, and in what ways contemporary
technology tools can support interventions at the university and in the field to promote
the kinds of teacher learning that is required to staff the classrooms of tomorrow.

2. Student Course and Program Portfolios in Geographic Information Science

David DiBiase has required students in GEOG 121: Mapping Our Changing World to
publish project assignments in their Personal Web space accounts since the course’s
inception in 1997. GEOG 121 is a social science general education course that is
concerned with the nature of geographic information and its roles in society. The course
consists of two weekly lecture sessions offered to the entire class and one-hour laboratory
sections offered to groups of 23 or fewer students. It is offered every fall and spring
semester to between 120 and 160 students. GEOG 121 is required for all geography and
environmental resource management majors, and is a prerequisite for all other courses in
the geographic information science option. The mix of students who enroll in the course
is typically diverse, however. Of the 130 students registered in the Spring 2001 semester,
for instance, only eight (six percent) were Geography majors; and just 44 (34 percent)
were associated with majors offered within the College of Earth and Mineral Sciences.

Three course projects culminate in illustrated HTML pages that students link to home
pages in their Personal Web spaces. Although students are encouraged to customize their
home pages, and are introduced to on-line tutorials that explain the concept of an e-
portfolio, many students simply link assignments to their default home pages. The first
course project asks students to copy and personalize a sample Web page by editing
simple HTML code with a text editor. A second project requires students to use an
HTML editor of their choice to replicate a sample Web page that is provided only as a
graphic image, so that no HTML source code is available. Finally, near the end of the
semester, self-organized groups of three or four students present ten-minute oral reports
illustrated with interlinked Web pages of their own design that are projected on a display
screen. Although students are encouraged to collaborate, each student is required to
publish his or her own Web page corresponding with his or her portion of the group
research and presentation.

Of the 100 GEOG 121 students who responded to an in-class survey on April 18, 2001,
33 percent indicated that they had previously been required to publish academic work on-
line. (This relatively high percentage of experience Web publishers may be explained by
the proportion of College of EMS students enrolled in the class, as well as the prevalence
of students in technical majors such as Engineering and IST. Fifteen Engineering majors,
for example, constituted the second largest sub-population in the class.) The courses
students cited where they had published work on-line included:
Graduate Teaching Assistants and undergraduate Teaching Interns provided all technical support for inexperienced students. TAs offered brief introductions to HTML, FTP, and related topics during laboratory periods early in the course. In addition, several lab periods were scheduled as optional work sessions during which TAs and TIs were able to focus on the needs of inexperienced students.

Undergraduate Teaching Interns were recruited from among the most successful students in the preceding semester to assist TAs in each lab section. In addition to attending section meetings, TIs were required to offer one-hour office hours during the evening prior to each scheduled lab session. These unpaid TIs, who earned just one internship credit, are crucial to the success of the Web publishing assignments in this course. With their help, and the help of the TAs, GEOG 121 instructors rarely if ever answer questions about HTML, FTP, or the like.

Of the 100 student respondents to the Spring 2001 survey, 93 percent indicated that they felt that the Web publishing requirement was worthwhile; thirteen said it was “very worthwhile.” Those who disagreed commented that the assignments seemed either too easy or too hard.

The same population of students was asked if they were likely to continue developing on-line portfolios of their academic work. Fifty-four percent said they were likely to do so; 25 percent said they weren’t, and 19 weren’t sure. Of the approximately 44 percent who seemed unlikely to continue, sixteen (more than one-third) stated that they would do so only if required by instructors.
3. Student Professional Web Portfolios in English

Since the summer of 1999, Jeannette Sabre has required some 500 students enrolled in English 202C, technical writing, and English 202D, business writing, to develop professional Web portfolios in their Penn State Personal Web space accounts.

English 202 is a required General Education Writing/Speaking course in advanced rhetoric and composition. The course requires students to write a number of documents, including resumes, cover letters, and different kinds of reports, using the content and discourse practices of students' respective majors.

The purpose of the professional Web portfolio assignment is to enable the audience to see the author of the portfolio as an individual, engaged in his or her field, and able to think and communicate about issues relevant to the field of study. The professional Web portfolio assignment is integrated into the course syllabus through an overarching framing strategy with initial and culminating Web assignments.

Initial assignment  The initial Web portfolio assignment requires students to create an index page that identifies the audience and purpose of the professional Web portfolio. This page also anticipates the four parts of the portfolio by including designations for links to resumes, professional Web resources, a PowerPoint presentation, and writing samples. The same assignment also asks students to activate two of these parts by saving a resume in PDF and by creating a professional Web resources page.

Early assignment  This early assignment takes about two weeks to complete, and with its short parts allows students to learn all the technological skills they need for further developing the professional Web portfolio. Through this assignment students learn how to make tables, how to save text as HTML and PDF, how to create external and internal hyperlinks, how to FTP to the server, and how to insert images and background. Of the editors available in Penn State computer labs, Netscape Composer proved the easiest to use.

Culminating assignment  The culminating professional Web portfolio assignment asks students to complete the portfolio with a PowerPoint presentation and their writing samples. The writing samples include two kinds of approaches to accommodating reading behavior. One asks for a Web article, designed to be read on the Web. Another requires a Web abstract with a link to writing saved as PDF. All these documents are prefaced with brief Web introductions that describe a critical context for the audience.

This overarching framing strategy has several benefits. One is that it ensures early success and a sense of the whole project. In addition, the design “scaffolds” learning, allowing students to build on learned skills as they revise and add to their portfolio at their own pace during the semester, in anticipation of the culminating assignment.

But how do students learn the technological skills and achieve early success? Although, broadly speaking, students in technical writing have science and engineering majors, and students in business writing have a business major or minor, the students represent diverse fields. Some of the fields are more technologically oriented than others, and
many students have no previous Web publishing experience. To meet these different skill levels, the course promotes a collaborative learning environment and introduces Web resources.

Collaborative learning occurs most easily in workshops held in public computer laboratories. However, although routinely holding classes in public computer laboratories has many advantages for writing classes, this scheduling has not always been possible. Nonetheless, even five to eight workshops can be effective. During these workshops, students rely on each other to develop or extend the skills they need. For example, expert students introduce editors to the class and help each other solve technological problems. In addition, to fulfill writing assignments, some students have created technology instructions for future classes.

As the real-time community functions to collaboratively help solve problems, a virtual community functions to inspire and create a portfolio culture. The course Web site provides links to the portfolios-in-progress of students in all current sections. Moreover, course community has historical presence in the archive of exemplary professional Web portfolios created by students from past semesters.

Outside of class as students work on their portfolios, they also make use of University resources. These resources include the University Learning Center in 7 and 8 Sparks Building, laboratory consultants, and the Center for Academic Computing help desks. The course Web page also provides links to the Web resources of the Center for Education Technology Services and the Center for Academic Computing Web Services.

With the paced course design, collaborative learning environment, and University resources, students are able to successfully complete the professional Web portfolio assignment.

The professional Web portfolio assignment has distinct pedagogical benefits. It promotes an active learning environment, meeting General Education active learning requirements, as students learn from each other and use technology to reflect and synthesize. In a writing classroom, publishing to a real audience inspires excellence, and writing for the Web, contrasted with writing on paper, foregrounds rhetorical issues of audience and purpose.

Moreover, informal written and verbal responses from students indicate that they appreciate the opportunity to create professional Web portfolios. It provides valued technological skills and a synthesis of their University experiences that can help them achieve career goals. In fact, as juniors and seniors, some students find immediate use for the professional Web portfolio in applying for graduate school or a professional position.

Assignments and illustrations of students’ professional Web portfolios from English 202 are available at http://www.personal.psu.edu/jms19.
4. Student Course Portfolios in Energy and GeoEnvironmental Engineering

Semih Eser, Associate Professor of Energy and GeoEnvironmental Engineering, has adopted e-portfolios as an optional student project in EGEE 101: Energy and the Environment, and EM SC 121: Minerals and Society. Beginning in Spring 2001, Semih adopted student portfolios as one of several alternatives to multiple choice exams. He defines “learning portfolios” as “personal account[s] of learning with connection to and reflection on relevant concepts/knowledge along a story line.” One of the group projects produced by his students earned first prize in the Center for Education Technology Services’ first WebFair. Colleagues Sarma Pisupati and Jonathan Mathews have also begun encouraging students to volunteer for portfolio assignments in their versions of EGEE 101 and related classes. Semih’s seminar presentation, with links to student examples, is available at http://www.e-education.psu.edu/seminar/fa01/0924/se_0924.htm

5. Student Course Portfolios in Teaching English as a Second Language

Karen Johnson, Professor of Applied Linguistics, has required students to produce hardcopy portfolios in APLNG (SPCOM) 493: Teaching English as a Second Language (TESL) since 1997. More recently, she convinced colleagues to adopt teaching portfolios as one of two final deliverables in the Master of Arts program in TESL. Karen notes several benefits, including that “students are better able to articulate their competencies,” and that “teaching portfolio requirements motivate instructors to rethink how they assess students.” On the other hand, evaluating portfolios is “the hardest part for faculty to deal with.” Karen’s guidelines for student portfolios in APLNG 493 are published at http://www.courses.psu.edu/spcom/spcom493_kej1/portfolio.html

6. On-line Resumes and e-Portfolios in the EMS First Year Seminar

The first e-Education Seminar (Fall 2000) culminated in a proposal to the Vice Provost and Dean for Undergraduate Education to introduce student e-portfolios in First-Year Seminars of the College of Earth and Mineral Sciences and the School of Information Sciences. The proposed project, later titled VITAE (Virtual Integration of Technology and Education) involved a three-step process in which students were asked to produce effective resumes, to post their resumes on the Web, and then to begin to transform on-line resumes into e-portfolios by uploading and linking examples of academic projects.

There were several justifications for envisioning e-portfolios as a later rather than initial stage in a developmental process. For one thing, the term “portfolio” means different things to different people, while “resume” is relatively unambiguous. Both instructors and students agree about what resumes are, and recognize their value. The proposal authors (including David DiBiase, Fred Loomis, Joe Schall, and David Howard) sought to leverage the familiarity and established utility of resumes, as well as the fact that resume writing was already an accepted standard practice in EMS First-Year Seminars, thanks to EMS Writer-in-Residence Joe Schall.
In the Spring of 2001, Vice Provost Cahir provided support needed to enable Joe and David Howard to offer a series of Web publishing workshops to EMS First-Year Seminar students, and to develop an on-line tutoring system to support students’ efforts outside of class. The VITAE tutoring system (http://www.e-education.psu.edu/portfolios/vitae) includes sections on resume writing, Web publishing, and portfolio guidelines.

During the Fall 2001 semester, Schall and Howard conducted eight one-hour workshops in computer labs (one for each section of the 3-credit EM SC 100S First-Year Seminar) to help students post resumes in their Personal Web space accounts. They also conducted follow-up e-portfolio workshops in three sections. Instructors of five of eight sections opted not to require the additional e-portfolio workshop. Not surprisingly, more instructors were willing to assign familiar resumes than unfamiliar portfolios.

At the end of the Fall 2001 semester, Howard surveyed the Web space accounts of all 132 students enrolled in EM SC 100S. As indicated in the following table, he found almost all students had activated their Penn State Web space accounts, and that nearly eight in ten had successfully published resumes in forms accessible to prospective visitors. Seminar instructors’ tentative embrace of e-portfolio assignments is reflected in the fact that fewer than one in ten students had begun to transform their resumes into portfolios by linking examples of their academic projects.

<table>
<thead>
<tr>
<th>Web Publishing by EMS First-Year Seminar Students, Fall 2001</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Web space accounts activated</td>
<td>98 percent (130 of 132)</td>
</tr>
<tr>
<td>Resumes successfully published</td>
<td>79 percent (104 of 132)</td>
</tr>
<tr>
<td>e-Portfolios published</td>
<td>8 percent (11 of 132)</td>
</tr>
</tbody>
</table>

While the VITAE project was unsuccessful in introducing e-portfolios into the EMS First-Year Seminars, it has produced useful data on students’ perceptions of the value of the resume and on-line resume assignments (see below). To the extent that on-line resumes may be considered an appropriate initial stage of student e-portfolio development, these data should be valuable to those who seek to design and implement student portfolio assignments or systems. The project also succeeded in producing an on-line tutoring system that 76 percent of respondents found to be helpful or very helpful in fulfilling their Web publishing assignments.

In addition to his survey of Web space usage among EMS First-Year Seminar students, David Howard also contacted students by email and requested that they respond to an anonymous on-line survey form by which they were able to express opinions about the VITAE project. After three rounds of invitations, fifty-four percent (72 of 132) of
students had responded. Their responses and comments are summarized in the following tables and discussion.

**Recommendations of EMS First-Year Seminar Students, Fall 2001**

“Do you recommend that the resume assignments be continued in future First-Year Seminars?”

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage (Number of Respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, strongly</td>
<td>49 percent (35 of 72)</td>
</tr>
<tr>
<td>Yes</td>
<td>42 percent (30 of 72)</td>
</tr>
<tr>
<td>Neutral</td>
<td>9 percent (7 of 72)</td>
</tr>
<tr>
<td>No</td>
<td>0 percent</td>
</tr>
</tbody>
</table>

Nine out of ten respondents agreed or strongly agreed that the resume writing assignment should be continued in future EMS First-Year seminars. Comments included the following:

- “It has given me a chance to start looking at my credentials that will be helpful in the future.”
- “The resume I had to do in high school was very unprofessional, both in content and format. I found it really helpful that we learned to do resumes the REAL way this year in our seminar.”
- “We didn't really have much to put on the resume yet, perhaps we should make it later on in college.”
- “It helps to learn about it early. Also developing it early is helpful so you know what to do. It gives you a base to start from.”

**Recommendations of EMS First-Year Seminar Students, Fall 2001**

“Do you recommend that students be assigned to publish their resumes online in future First-Year Seminars?”

<table>
<thead>
<tr>
<th>Response</th>
<th>Percentage (Number of Respondents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, strongly</td>
<td>39 percent (28 of 72)</td>
</tr>
<tr>
<td>Yes</td>
<td>44 percent (32 of 72)</td>
</tr>
<tr>
<td>Neutral</td>
<td>14 percent (10 of 72)</td>
</tr>
</tbody>
</table>
Respondents were only slightly less enthusiastic about publishing their resumes on-line. More than eight in ten agreed or strongly agreed that the assignment should be continued in future EMS First-Year Seminars. Some raised concerns about privacy, and about the need to teach Web publishing skills at all. Comments included:

- “It’s good to know how to do some things with the internet besides just surfing it.”
- “Learning how to put something on the web was the most helpful part of all the seminars.”
- “Any class that requires a first year student to post a document online is valuable, but the class does not have to be freshman seminar.”
- “I found the web publishing exercises to be incredibly boring. In this day and age, most students do know how to put information on the internet. If the exercises continue, the class periods should be more exciting in some way, shape, or form.”

**Recommendations of EMS First-Year Seminar Students, Fall 2001**

**“Do you recommend that students be assigned to link examples of their work to their online resumes in future First-Year Seminars?”**

<table>
<thead>
<tr>
<th>Option</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, strongly</td>
<td>14 percent (10 of 72)</td>
</tr>
<tr>
<td>Yes</td>
<td>28 percent (20 of 72)</td>
</tr>
<tr>
<td>Neutral</td>
<td>56 percent (40 of 72)</td>
</tr>
<tr>
<td>No</td>
<td>3 percent (1 of 72)</td>
</tr>
</tbody>
</table>

Since most students were not required to link examples of their work to their on-line resumes (and many who were encouraged to do so were foiled by technical failures during workshops), it is not surprising that most (nearly six in ten) would not wish to offer an opinion about the value of that activity. What is surprising, however, is that more than four in ten did recommend that linking examples of their academic work should be required in future EMS First-Year Seminars. Furthermore, 44 percent (32 of 72) recommended that “instructors should encourage students to link assignments to their on-line resumes in other classes,” while only three percent (2 of 72) disagreed with that recommendation. The following selected comments reflect the persistent ambiguity of the portfolio concept:

- “I don’t really understand what this is asking, but I wish I did!”


• “I didn’t understand the point of this activity until I was told that having a portfolio can really make an applicant for a job look better.”
• “I wish I knew how.”
• “I really don't want people to see my work!!”
• “I recommend this because a student will not really get a chance to learn the skill in another class.”

Equally surprising, as indicated in the table below, is that fact that **three in ten students expected to link examples of future academic work to their on-line resumes, while another four in ten expected to do so only if required by instructors.**

**Recommendations of EMS First-Year Seminar Students, Fall 2001**

<table>
<thead>
<tr>
<th>“Do you expect to continue to link examples of your academic work to your on-line resume?”</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, whether I'm required to or not</td>
<td>32 percent (23 of 72)</td>
</tr>
<tr>
<td>Yes, but only if I'm required to</td>
<td>43 percent (31 of 72)</td>
</tr>
<tr>
<td>No, I don't have the time</td>
<td>12 percent (9 of 72)</td>
</tr>
<tr>
<td>No, it isn't worth the effort</td>
<td>8 percent (6 of 72)</td>
</tr>
</tbody>
</table>

Most students participated in a single one-hour workshop in which they were able to work together to upload resumes to their Personal Web space accounts. Given that less than 20 percent of respondents (14 of 72) claimed previous Web publishing experience, it is somewhat remarkable that so many succeeded (79 percent, 104 of 132). This outcome is consistent with Springfield’s (2001) formative study of Kalamazoo College’s portfolio initiative, in which she found that about 80 percent of students were able to learn basic Web publishing skills in a one-hour workshop.

Students cited peer collaboration, the VITAE tutoring system, instructors, and their own previous experience, in that order, as sources of the help they needed to fulfill their Web publishing assignments. As Joe Schall and David Howard pointed out in the concluding seminar session, **one of the most important benefits of the Web publishing workshops was the collaborative atmosphere they fostered.** The least favorable aspect reported by instructors included logistical hassles involved in scheduling computer laboratory space and in obstacles posed by technical failures. On balance, it appears likely that benefits will be judged to outweigh shortcomings, and that the VITAE project...
will be continued in next year's EMS First-Year Seminar, as a large majority of student respondents recommended.

Pages from a student e-portfolio by Jeff Mock, a first-year Penn State student majoring in Meteorology. Jeff’s personal home page is shown in the upper left. Upper right is his resume, which he created and published in the EMS First-Year Seminar. Lower left is a laboratory report produced for EARTH 103: Earth Futures, a course in which he is currently enrolled. In the lower right is a project Jeff produced as a student in GEOG 121: Mapping Our Changing World, which Jeff took during the preceding semester.

7. Teaching With Technology and Web Professional Certificate Programs

The Center for Education Technology Services launched a Teaching With Technology certificate program for Penn State graduate students in 2001. The goal of the program is to help teaching assistants gain a “solid repertoire of technology skills for use in teaching” (http://cac.psu.edu/twt/index.html). Program requirements include development of an e-portfolio that is expected to include a home page, a statement of teaching philosophy, and examples of learning resources and assessment methods that the teaching assistant has developed or employed. Certificates are granted by the Graduate School after review by committees appointed by students’ academic units.

The Web Professional Certificate Program, (http://www.webpro.psu.edu/), an outreach program of the Penn State’s School of Information Sciences and Technology, also includes a capstone course, IST 6776: Portfolio Review, in which students are required to develop professional e-portfolios.
8. Division of Student Affairs

Philip Burlingame, Assistant Vice President for Student Affairs, followed the 2001 e-Education Seminar closely, and reported interest in the e-portfolio concept among colleagues within the Division of Student Affairs. Burlingame noted a number of “clear tie-ins” to the work being done by seminar participants, including the fact that more than 7,500 students submit resumes each year to Penn State Career Services, whose resume writing resources (http://www.sa.psu.edu/career/resume.html) seemed to overlap in a potentially fruitful way with the College of EMS’ VITAE on-line tutoring system. The professional staff of the Division’s Office of Career Services is well aware of career-oriented e-portfolio initiatives at institutions like Florida State, Iowa, and others. They also seem keenly aware that gaps between academic and career development programs pose formidable barriers to such initiatives. To help bridge the gap at Penn State, Career Development and Placement Services director Jack Rayman has encouraged Associate Director Bob Orndorff to help develop a model e-portfolio development course that is planned to launch in Spring 2003. (A draft course proposal is included as an appendix to this report.)

9. eLion

During the November 26 session of the 2001 Seminar, Jim Levin, Senior Programs Coordinator in the Division of Undergraduate Studies, along with colleagues Mike Leonard and Ruth Hussey, described the “Academic Advising e-Portfolio” that has been discussed among the eLion design team for the past five or six years. The team predicts that eLion’s “Exploring Majors” option will soon comprise three interactive decision support tools that guide students through the process of assessing their personal characteristics, assessing the characteristics of Penn State majors, and identifying majors that seem to be most suitable for them.

The Academic Advising e-Portfolio is conceived as a container within which students can save the results of their explorations, facilitating reflection as their student careers progress. Levin, Leonard, and Hussey expressed hope that the planned eLion portfolio system might also serve as a repository for selected products of students’ curricular and co-curricular activities, as well as a vehicle for sharing such products with various audiences.

III. What’s Going On at Other Institutions?

The cases and surveys reported in the preceding section indicate that Penn State students rarely create e-portfolios unless they are required to do so by instructors. Since few instructors require students to “publish” academic work on-line, Personal Web space accounts are underutilized, and student e-portfolios are rare. No coordinated, system-
wide student e-portfolio initiative has been attempted at Penn State. Numerous individual and group e-portfolio initiatives are underway within several colleges and support units, however. Surveys of CIC institutions, combined with reviews of research literature concerned with student portfolios, suggest that Penn State’s e-portfolio activities are typical of comparable U.S. institutions.

e-Education Institute intern Laura Fletcher conducted a survey of CIC institutions during the summer of 2001. Her study (the results of which are published at http://www.e-education.psu.edu/portfolios/benchmarking.shtml) revealed that the Career Services units of two institutions, the University of Iowa and the University of Minnesota, have initiated voluntary, system-wide student e-portfolio projects. The activities of other CIC institutions are similar to Penn State’s, with isolated individual initiatives, typically (as at the University of Wisconsin-Madison and Purdue University) tailored to the needs of education students. Everywhere, substantive linkages between Career Services units and academic units are unusual, and therefore student participation rates are low.

Beyond the Big 10, very few institutions have adopted system-wide, programmatic student e-portfolios. The few that have, including Alverno College and Kalamazoo College, tend to be small, private, and specialized in liberal arts curricula. Among institutions whose size and missions are more comparable to Penn State’s, Florida State’s Career Portfolio, Stanford’s e-Folio, and the e-Portfolio Consortium based at Indiana University-Purdue University at Indianapolis are among the most ambitious initiatives. Brief profiles of these initiatives follow.

A. Profiles of Exemplary Projects

1. Alverno College

Alverno College is “a four-year, liberal arts, independent, Catholic college for women, located in Milwaukee, Wisconsin” (http://www.alverno.edu/about/about_index.html). It has “long been recognized for its work with student self-assessment” (Yancey 2001a p. 22). With support from several foundations and the U.S. Department of Education, Alverno developed its programmatic “Diagnostic Digital Portfolio” to help students and advisors “track [the student’s] growing development as a learner in her general education, major and support area courses and help her develop strategies for improvement” (http://www.ddp.alverno.edu/). The types of evidence included in Diagnostic Digital Portfolios include descriptions of “key performances” (crucial assignments or activities), self-assessments of the key performances, and instructor or advisor feedback. Students are required to document key performances in several realms (including communication, analysis, problem solving, valuing, social interaction, global perspective, aesthetic response) at four levels of sophistication.
Sample of Alverno College’s Diagnostic Digital Portfolio (http://www.ddp.alverno.edu/ddpsamp/ddpsamp1.htm)

2. Kalamazoo College

Kalamazoo College describes itself as “a private, four-year, co-educational college of liberal arts and sciences” that is ‘nationally recognized for our innovative ‘Kalamazoo Plan,’ an unparalleled program that combines optional off-campus career-development internships and study abroad experiences with a program of on-campus courses and a senior individualized project’ (http://www.kzoo.edu/admiss/facts.html). The college initiated a “Kalamazoo Portfolio” program in 1996 “to help students view these activities … as a cohesive whole with all parts contributing to their education” (Springfield 2001, p. 53). Students are introduced to the portfolio during the orientation week preceding their first year. Portfolios are required for graduation, but students are not required to conform to standardized templates. Portfolio consultant Emily Springfield observed that “about 80 percent of students were able to compose functioning Web pages after one required [one-hour] workshop” (Spring 2001, p. 55). In response to the difficulties experienced by the 20 percent of students who did not readily succeed, Web publishing is recommended, but not required. Lack of participation by about half of academic advisors
is reported to be “the largest stumbling block” in the development of the portfolio program.

Exemplary e-portfolio by Kalamazoo College student Kristin Stahley, featured at the Kalamazoo e-portfolio site (http://www.kzoo.edu/pfolio/).

3. Stanford University

Stanford Learning Laboratories (SLL) has undertaken a longitudinal study of thirty freshmen through their four years at Stanford University. The objectives of the study are “to develop a systematic understanding of the entire educational experience of Stanford undergraduate students and to capture the interaction between formal curricula and informal learning taking place within the university environment” (http://sll.stanford.edu/projects/hlc/index.shtml). In conjunction with this research, SLL is developing an electronic learning portfolios software tool called “E-Folio” that is designed to enable students to portray, and instructors and researchers to assess, students’
cumulative learning experience in an integrated, sharable format. SLL describes the E-Folio as a “ubiquitous, portable, electronic knowledge databases that are private, personalized and sharable, and are easily accessible via the web” (http://sll.stanford.edu/consulting/tools/efolio/).

4. Florida State University

One of the most elaborate and fully articulated examples of a career-oriented portfolio initiative is Florida State University’s Career Portfolio. Developed and managed by the University’s Career Center, this thoroughly templated system aims to help students document nine “marketable, transferable” skill sets that “employers and graduate schools look for,” including communication, creativity, critical thinking, leadership, life management, research/project development, social responsibility, teamwork, and technical/scientific (https://apps.oti.fsu.edu/fsu/ais/portfolio/jsp/intro/step1.jsp).

Sample Florida State University student career portfolio published at http://www.career.fsu.edu/portfolio/index.html
5. University of Iowa

The University of Iowa Career Center conceives its “Iowa Advantage” program as a “comprehensive career development program with a tangible outcome—an electronic portfolio of [students’] professional work samples” (http://www.uiowa.edu/~careers/iadvan/visitors/index.html). The program is open to all registered students, but a four-semester commitment is encouraged. For a per-semester fee of $50, participants gain access to a dedicated computing laboratory, 6 Mb of Web space, portfolio design guidance, individual career counseling, and a mock interview with an Iowa alumnus. Perhaps due to the lack of connection with academic programs, uptake has been modest, however; in a telephone conversation with Laura Fletcher, program facilitator Phill Seebeck estimated that fewer than 200 students had participated.

6. University of Minnesota

“Portfolio” is listed under the heading “Academics” on the University of Minnesota “One Stop” student portal. The system enables registered students, as well as faculty members and staff members, to create personal portfolios. Users can extend access to individuals outside the U of M community by adding names to a “share list.”

7. e-Portfolio Consortium

A dozen computer scientists, IT and education specialists, and administrators representing UCLA, Penn State, and Indiana University–Purdue University of Indianapolis (IUPUI) met on October 28, 2001, in Indianapolis to discuss the prospect of jointly developing an enterprise e-portfolio system. Dr. Ali Jafari, one of the lead developers of the ANGEL course management system adopted this year as Penn State's “common e-learning environment,” presented a preliminary conceptual design of the product.

The system Dr. Jafari described would require universities to securely store digital products of student assignments in addition to the letter grades and related summary data they currently store and report via transcripts. The design envisions two ways in which students might submit products to the system: directly, or indirectly through a faculty member. Only those products submitted through faculty members could be certified for authenticity. Certified documents would be stored in a read-only format. The system would generate e-portfolios dynamically in response to requests by visitors who have been authorized to view selected documents. Students would control access to documents by editing personal profiles.

One of the most intriguing possibilities arising from the proposed system is that it would provide an environment within which intelligent agents might be applied to perform a host of functions, one of which might include checking the academic integrity of documents within a class, between successive offerings of the same class, or among different classes or even different institutions. The ability to detect plagiarism seems sure
to be an attractive feature to many faculty members. Although, John Harwood points out, a technological solution to academic dishonesty is unlikely, it does seem likely that a widely adopted e-portfolio system of the sort envisioned by Jafari has the potential to offer attractive diagnostic features. The importance of designing an e-portfolio system that offers clear-cut benefits to faculty members should not be underestimated, moreover, since faculty members are the gatekeepers who decide what students will or will not be required to do to earn academic credit and degrees. Anti-plagiarism tools might be one of the most attractive benefits from a faculty perspective. Depending on how an e-portfolio system is designed, academic integrity may be either a weakness or a selling point.

IV. Conclusion and Recommendations

The research and applications studied during the 2000 and 2001 e-Education Seminars have convinced many participants that e-portfolios are promising vehicles for helping students to play more active roles in planning and showcasing their university careers. Most students recognize the benefits of Web publishing, and value the opportunity to broadcast evidence of their academic work and co-curricular activities via the Web. Students and instructors alike also recognize, however, that portfolios are burdensome to create, maintain, and evaluate. The potential benefits of e-portfolios are therefore unlikely to be realized unless instructors require, or at least encourage, students to incorporate examples of their coursework in their Personal Web space accounts (or in some other e-portfolio system, such as the one envisaged for eLion).

Instructors are unlikely to assign portfolio activities unless the benefits of such activities are clearly demonstrated, and until they are assured that the act of assigning such activities will entail an acceptably small amount of additional effort on their part. The greatest challenge confronting widespread adoption of student e-portfolios (though certainly not the only one) is to raise instructors’ expectations. Compelling exemplars of student e-portfolios are needed, as well as evidence that students possess, or at least have access to, the requisite skills and technology. Furthermore, since instructors’ (and students’) objectives for e-portfolio activities are sure to vary widely, standardized portfolio templates and “wizard” interfaces optimized for ease of use (rather than flexibility) seem likely to discourage more potential adopters than they will attract.

The free Personal Web space accounts provided by the Center for Academic Computing comprise the core technical infrastructure needed to support e-portfolio activities at Penn State. What remains is to create the complementary pedagogical and support infrastructure that will encourage instructors to expect their students to become producers, not just consumers, of Web-based information.

In the near term, the Center for Education Technology Services (CETS) and Center for Academic Computing (CAC) can help by hosting and cooperating in the development of
a new, centrally maintained Web site for e-portfolio developers (“portfolio.psu.edu”) that includes the following features:

8) A **new default home page** for Personal Web space accounts that includes a link to portfolio.psu.edu.

9) A **gallery of best practices** in student e-portfolios (including WebFair award winners)

10) An on-line tutorial and self-assessments on **how to create an effective resume** (The resume tutorial and resume generator authored by Joe Schall and David Howard as part of the e-Education Institute’s VITAE system are good starting points, as are materials maintained by the Office of Career Services.)

11) An on-line tutorial and self-assessments on **file management** (including file naming and uploading, and incorporating ongoing improvements to CAC’s Penn State Access Storage Server system).

12) A set of on-line tutorials and self-assessments on **how to capture evidence in digital formats** that are compatible with Web browsers.

13) A set of on-line tutorials and self-assessments on **reflective writing.**

14) A set of on-line tutorials and self-assessments on **privacy** and **free speech.**

Although some of these resources already exist, they are not consolidated in one location that is linked to the default home pages in students’ Personal Web space accounts. Thus, instructors and students who need these resources may not find them.

Some of the ways in which academic units might help address these needs include:

5) **Encourage First-Year Seminar instructors to require students to activate their Personal Web space accounts, to develop resumes, and to link their resumes to their personal home pages.**

6) **Develop and offer practicum courses in professional e-portfolio development** for second-, third-, and fourth-year students. Properly conducted and promoted, such courses may help convince instructors in other courses that students have what it takes to fulfill Web publishing assignments. (A model course proposal developed by the College of Earth and Mineral Sciences, in collaboration with the Office of Career Services, follows as an appendix to this report.)

7) **Encourage instructors to request Technology Learning Assistants** ([http://cac.psu.edu/tla](http://cac.psu.edu/tla)) to help instructors develop and test e-portfolio-related assignments, and to recruit undergraduate **Teaching Interns** to provide peer technical support.
8) **Encourage academic advisors to consult advisees’ Personal Web space accounts**, and to advise that students use their accounts to document and reflect upon their university experiences.

In the longer term, we believe that CETS and CAC, in collaboration with other interested institutions, should develop an “e-portfolio learning system” that supports students in planning, constructing, managing, assessing, and reporting their learning. The e-portfolio learning system’s role in supporting student learning would be analogous to the role that the ANGEL course management system plays in supporting faculty teaching. The e-Portfolio Consortium (see Section III.7, page 34) might be the most likely place to develop inter-institutional collaborations needed to produce such a system.

We believe that the near-term and long-term actions outlined above, combined with an energetic and sustained promotional effort, will enable Penn State students to 1) capture examples of their learning, 2) reflect upon what they have learned and adjust their learning paths, and 3) demonstrate what they have learned throughout their university careers in forms they can easily and effectively share with instructors, fellow students, family members, potential employers, and others.
V. Model Proposal for e-Portfolio Development Course

NEW COURSE PROPOSAL
EARTH AND MINERAL SCIENCES 400:
PRACTICUM IN PROFESSIONAL E-PORTFOLIO DEVELOPMENT

A. Heading as it would appear in the appropriate University Bulletin

Abbreviation: EM SC
Number: 400
Title: Professional e-Portfolio Development
Abbreviated Title (18 bytes maximum): Portfolio Dvlpmnt
Credits: 1 credit per semester, maximum 4
Description (20 words or less): Design, creation and critique of on-line portfolios for personal and professional development. For second-, third-, and fourth-year EMS students.
Prerequisites: None

B. Course Outline

1. Brief outline of course content

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Course introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 2</td>
<td>Assessment of student Web publishing skills</td>
</tr>
<tr>
<td>Week 3</td>
<td>Workshop on elementary Web publishing skills (led by experienced students as appropriate): How to save work examples in Web-compatible formats</td>
</tr>
<tr>
<td>Week 4</td>
<td>Workshop on advanced Web publishing skills: Digital video</td>
</tr>
<tr>
<td>Week 5</td>
<td>Introduction to Penn State Career Services</td>
</tr>
<tr>
<td>Week 6</td>
<td>Career assessment / e-portfolio design consulting</td>
</tr>
<tr>
<td>Week 7</td>
<td>Career assessment / e-portfolio design consulting</td>
</tr>
<tr>
<td>Week</td>
<td>Topic</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Group review of preliminary e-portfolio designs</td>
</tr>
<tr>
<td>9</td>
<td>Introduction to LionLink and career coaching</td>
</tr>
<tr>
<td>10</td>
<td>Workshop on reflective writing</td>
</tr>
<tr>
<td>11</td>
<td>Introduction to the mock interview</td>
</tr>
<tr>
<td>12</td>
<td>Evaluation criteria for student e-portfolios</td>
</tr>
<tr>
<td>13</td>
<td>One-on-one e-Portfolio design consulting</td>
</tr>
<tr>
<td>14</td>
<td>Presentations and Critiques</td>
</tr>
<tr>
<td>15</td>
<td>Presentations and Critiques</td>
</tr>
<tr>
<td>16</td>
<td>Presentations and Critiques</td>
</tr>
</tbody>
</table>

EM SC 400 will be team-taught by faculty and staff members of the College of Earth and Mineral Sciences and the Office of Career Services. The one-credit course will meet for one two-hour session per week in a technology classroom equipped with networked computers for every student. Students will be able to enroll in the course for one credit per year throughout their undergraduate careers, up to a maximum of four credits.

After the first few years of operation, we expect that each section of the course will contain three broad groups of students:

a) Sophomores with little or no portfolio experience and two or three semesters of college courses.

b) Upperclass students who have taken the course in previous years. These will have some portfolio experience and a broader and more extensive college background. They will be ready to construct more sophisticated portfolios in terms of content and design.

c) Upperclass students taking the course for the first time. These students will have the same college experience as the previous group but little or no knowledge of portfolios. These students will have to integrate the same college experiences as their peers, but with fewer or less sophisticated portfolio skills.

The same course outline will be used for all sections. Students within each section will be grouped according to their previous experience. Accordingly, the goals and expectations associated with course assignments will vary depending on each student’s previous experience in the class. For instance, students who participated in career assessment sessions in an earlier semester will not be required to repeat that activity, but will be provided with an opportunity for a one-on-one portfolio design consultation instead.
Experienced students also will be expected to mentor students who enroll in the class for the first time.

2. Major topics with approximate time allocations

a. Assessing and developing skills in Web publishing and reflective writing (about one half of all student activity): EMS faculty and staff members (with the assistance of experienced undergraduate Teaching Interns) will help students learn to create and save documents from word processing, graphics, and presentation software in Web-compatible formats. Students will also learn to produce and edit digital video suitable for Web delivery. Readings and instructor presentations will lead students to consider and specify design objectives and evaluation criteria. Writing assignments and feedback will help students develop reflective writing skills.

b. Helping students develop strategic approaches to career planning (about one quarter of all student activity): Faculty and staff members of Penn State’s Office of Career Services will help students assess personal abilities, interests, and priorities, and develop job search and interview skills. Students will participate in career assessment sessions, videotaped mock interviews and interview critiques. They will be paired with alumni “career coaches” who have volunteered to discuss students’ career goals, and to help evaluate student e-portfolios.

c. Presentations and critiques (about one quarter of all student activity): EMS faculty and staff members will supervise individual student presentations and group critiques. Students will learn to offer, accept and use constructive criticism.

3. 400-word course description, including objectives’ relationship to courses and programs (but without course numbers); evaluation methods

The EM SC 400 course on Professional e-Portfolio Development is intended to help second-, third-, and fourth-year undergraduate students in the College of Earth and Mineral Sciences adopt proactive, strategic approaches to planning their Penn State careers and developing professional and personal goals for life after graduation.

As a vehicle for reflective learning and professional development, the course will require each student to design, create, and maintain an on-line portfolio that contains evidence of his or her curricular and co-curricular activities. The course will be team-taught with faculty and staff members of Penn State’s Office of Career Services, who will provide students with career assessment sessions, videotaped mock interviews, and one-on-one consultation with alumni career coaches. In addition, students will develop or improve the information design and technology skills needed to become active producers, rather than passive consumers, of Web-based information.
EM SC 400 will serve as a career-oriented follow-on to EM SC 100S, the EMS First Year Seminar. The course will be offered every Spring semester for one credit. Students and instructors will meet for one two-hour session each week in a technology classroom in which all students have access to networked personal computers. Students will be allowed to take the course up to four times. Within each course section, students will be will work in groups based upon the extent of their previous experience in the class. Repeat students will be expected to mentor first-time students. For example, experienced students may be asked to demonstrate advanced skills, provide technical support, and help conduct mock interviews (under the supervision of Career Services staff and interns).

Student performance will be evaluated on the basis of participation, skills improvement, fulfillment of individual course goals, the ability to offer and accept constructive criticism, and collaboration (helping fellow students to achieve their goals).

4. Faculty members responsible for course development
David DiBiase, Director, EMS e-Education Institute
Robert Orndorff, Associate Director, Career Services

C. Justification Statement

1. Instructional, Educational, and Course Objectives

Resumes and transcripts are impoverished representations of the rich and diverse curricular and co-curricular activities in which students participate throughout their Penn State careers. The Web space accounts offered free to all Penn State students provide the key infrastructure needed to “publish” authentic examples of their achievements. On-line portfolios (e-portfolios) enable students to demonstrate and reflect upon what they have learned throughout their university careers in a form that they can easily and effectively share with instructors, fellow students, family members, potential employers, and others. The process of e-portfolio development provides students with a structured opportunity to adopt a strategic approach to planning their Penn State experiences and subsequent professional careers.

EM SC 400, Practicum in Professional e-Portfolio Development, aims to help EMS undergraduates achieve the following objectives:

1. Identify and articulate personal and professional goals
2. Establish a relationship with an alumni career coach
3. Collect artifacts of curricular and co-curricular activities and achievements in formats suitable for publication on the World Wide Web
4. Select artifacts associated with significant learning or skills development
5. Reflect on the extent to which one's evolving portfolio of knowledge, skills, and dispositions aligns with personal and professional goals, and adjust goals or learning path as needed
6. Develop the information design and information technology skills needed to create and maintain an effective e-portfolio in Personal Web space
7. Solicit, acquire and use constructive criticism from peers, and offer it to others.

The course will be developed and taught by a team of faculty and staff members of the College of Earth and Mineral Sciences and Penn State’s Office of Career Services. In addition, alumni “career coaches” will be enlisted to consult with students and help assess student e-portfolios.

2. Evaluation Methods

Instructors and alumni “career coaches” will evaluate student performance on five criteria:

1. Instructors affiliated with the College of Earth and Mineral Sciences’ e-Education Institute will judge the extent to which students master the information design and technology skills needed to design, produce, and maintain an effective e-portfolio.

2. EMS Instructors will also judge the quality of students' e-portfolios in demonstrating fulfillment of learning objectives recommended by academic departments, where applicable. Instructors will invite faculty members in all of the College’s departments and programs to suggest specific competencies that accreditation agencies and key employers expect students to demonstrate.

3. Instructors affiliated with Penn State Career Services will judge the extent to which students participate in assigned individual and group career counseling activities.

4. Alumni “career coaches” will judge the effectiveness of e-portfolios and related communications in representing students as qualified candidates for their chosen careers.

5. Students who are taking the course for the second, third, or fourth time will be expected to mentor first-time students. EMS instructors will judge the extent to which repeat students accept leadership roles in the course, including providing demonstrations, technical support, and assisting in mock interviews.

6. EMS instructors will also judge students’ performance in offering and accepting constructive criticism from peers and instructors.

EMS instructors will be responsible for combining the three sets of evaluations into a single letter grade.

3. Relationship/linkage of course to other courses

Penn State’s Office of Career Services currently offers four credit courses related to student professional development, including:

- AG 100 Job Placement Skills and Strategies
- CN ED 297A Effective Personal and Career Decision Making
- CN ED 303 Career Search for Educators
- LA 401 Professional Development for the Liberal Arts
No department or program in the College of Earth and Mineral Sciences currently offers such a course, however, and none of the existing courses employs e-portfolios as a vehicle to foster reflective learning and professional development.

All Colleges offer First Year Seminars (e.g., EM SC 100S). The course proposed here is envisioned as a logical follow-on from the First Year Seminar. Students may elect to participate in the course in their second, third, and fourth years at Penn State. The course will be particularly useful as a capstone experience for graduating seniors.

4. Relationship of course to major, option, minor or general education

EM SC 400 will be available to all EMS students as an elective.

One EMS department—Geography—has already expressed interest in making the course a requirement for all of its undergraduate degree candidates.

Web publishing skills developed in EM SC 400P will prepare students to deliver more sophisticated assignments in other EMS classes.

5. Consultation with appropriate department and academic support units

The course was developed in consultation with Penn State’s Office of Career Services. Copies of the draft proposal were circulated to all College Associate Deans for Resident Instruction for their comment.


[Forthcoming]

7. Frequency of offering and expected enrollment

The class will be offered every Spring semester. Students will be able to enroll for one credit at a time, up to a maximum of three credits. The course will meet once each week for a two-hour session in a public computing laboratory.

Enrollment will be limited to one section of 16 students each in the first offering of the course. By the second or third year, we expect to offer up to three sections of 16 students each.

D. Effective Date

Spring semester 2003
VI. References and Suggested Readings


