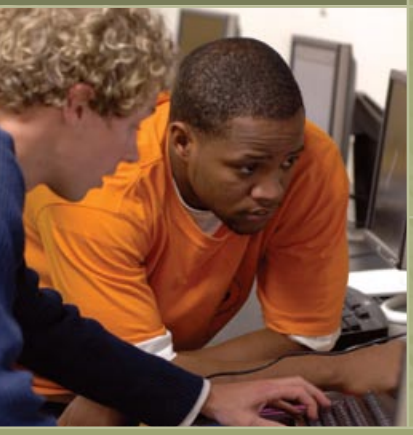
VALUE
Valid Assessment of Learning in Undergraduate Education



Electronic Portfolios and Student Success
Effectiveness, Efficiency, and Learning

BY Helen L. Chen and Tracy Penny Light

AAC&U Association of American Colleges and Universities

Electronic Portfolios and Student Success

Effectiveness, Efficiency, and Learning

BY Helen L. Chen and Tracy Penny Light

Association of American Colleges and Universities

Association of American Colleges and Universities
1818 R Street, NW, Washington, DC 20009

ISBN 978-0-911696-69-1

The Association of American Colleges and Universities gratefully acknowledges the support of State Farm Companies Foundation and the Fund for Improvement of Post Secondary Education, of which 95 percent (or $2,450,372) was from federal funds, and 5 percent (or $125,000) was from nongovernment sources.

Photos courtesy of: Buffalo State College; Yeshiva University; Birmingham Southern College; and Sacred Heart University.

Contents

Foreword

Through its work on the Liberal Education and America's Promise (LEAP) initiative, and especially in the board-level statement *Our Students' Best Work*, the Association of American Colleges and Universities (AAC&U) has called for forms of assessment that are

- grounded in the work students are asked to do as part of the undergraduate curriculum;
- guided by the aims and outcomes essential to achieve liberal learning anchored in the mission and goals of the local institution;
- consistent with clearly articulated expectations for quality performance at progressively more sophisticated and challenging levels as students move from entry to culminating work,
- focused on our students' best work, not simply minimal or introductory levels of attainment;
- evaluated at multiple points throughout a student's educational pathway;
- communicated in meaningful ways to students, faculty, and external audiences concerned with quality student learning.

Through the Valid Assessment of Learning in Undergraduate Education (VALUE) initiative, AAC&U worked with faculty and campuses across the country to explore the viability of practices that would meet these standards. In 2007, AAC&U embarked on a national effort to explore these various questions: Is there a way for students to demonstrate their learning through the cumulative work they are asked to produce across the curriculum and cocurriculum, rather than just through a snapshot test? Is it possible to capture the outcomes of liberal learning in all their rich and varied dimensions? Is there a shared set of expectations for learning that individual faculty members can use in the classroom, that can be aggregated for programmatic evaluation and sampled for institutional reporting? Can individual assignments and the resultant work be the means of demonstrating student learning throughout a student's educational pathway across and among different institutions without significantly increasing faculty workload? Can the shared expectations for learning be articulated so that students can use them to understand and make judgments about their own strengths and weaknesses? Can we recognize and honor the diversity of institutions and students while establishing a nationally shared set of broad, nuanced expectations for learning, regardless of type of institution, mission, or location? Can we assess student learning in ways that actually provide faculty and students with information helpful to improve pedagogy and the development of learning over time as well as provide programs and institutions with summative information for reporting? In short, can the direction and assumptions of the national conversation on accountability and the assessment of student learning be changed?

Can the shared expectations for learning be articulated so that students can use them to understand and make judgments about their own strengths and weaknesses?

Through VALUE, AAC&U has maintained that what students and faculty do through teaching and learning constitutes a most complex set of processes;

that learning needs to occur across a broader set of outcomes than the current standardized tests measure; and that learning is developmental or emergent over time, progressing faster in some outcome areas than in others and becoming more complex and sophisticated as students move through their educational pathways. The work that we ask students to do should and can be the basis for assessing their learning.

Through the VALUE initiative, we developed rubrics—reported in *Assessing Outcomes and Improving Achievement: Tips and Tools for Using Rubrics* and available online at www.aacu.org/value/rubrics—for fifteen of the LEAP Essential Learning Outcomes. The rubrics were developed by teams of faculty and other academic professionals representing all types of higher education institutions. These rubrics articulate broadly shared expectations for learning by faculty across the country and can be used to evaluate student work and achievement on core elements of learning. Two example rubrics are included in Appendix B.

Electronic portfolios are emerging on campuses across the country as a means for students to reflect systematically on their own learning.

Through VALUE, AAC&U also worked intensively with campuses that are using portfolios and electronic portfolios to focus, synthesize, and report on students' learning over time. Electronic portfolios are emerging on campuses across the country as a means for students to reflect systematically on their own learning; for faculty to represent and evaluate multimodal ways for students to demonstrate their learning through text, performance, and visual or audio media; and for institutions and programs to assess, document, and share student learning through the curriculum and cocurriculum. The growth in student and faculty interest in electronic portfolios and their potential is evidenced by the growth in the varieties of portfolio software available in the marketplace. The increase in portfolio options, the decrease in price, and the improvements in the technical abilities of e-portfolios to meet campus needs for flexibility, structure, form, and function have spurred the adoption of portfolios for learning.

Electronic Portfolios and Student Success: Effectiveness, Efficiency, and Learning is the second of two publications that have emerged from the VALUE project. Its focus on electronic student portfolios recognizes that learning occurs in many places, takes many forms, and is exhibited through many modes of representation. Our students come to us schooled in a multimedia environment dominated by technology and its social networking frames for communication. Faculty efforts to assess student learning and to help students develop the ability to judge the strengths and weaknesses of their own learning must keep pace with the technological, developmental, and cognitive changes that are transforming the global knowledge environment.

Electronic Portfolios and Student Success: Effectiveness, Efficiency, and Learning presents an overview of electronic portfolios and how individuals and campuses can organize to explore the development and implementation of e-portfolios for enhanced student learning. The publication is organized around

eight issues that are central to implementing an e-portfolio approach to both advance and assess learning outcomes:

- Defining learning outcomes
- Understanding your learners
- Identifying stakeholders
- Designing learning activities
- Including multiple forms of evidence
- Using rubrics to evaluate e-portfolios
- Anticipating external uses of evidence
- Evaluating the impact of e-portfolios

Throughout their discussion of the issues, the authors emphasize the effectiveness of e-portfolios and the efficiencies that can accompany a well-planned portfolio approach. Campus examples are used to illustrate how different types of institutions are actually using e-portfolios for learning. The authors also have developed a case study of a course—History and Film—that appears throughout the text to illustrate how individual faculty members can design their own courses within a campus e-portfolio approach to meet course outcomes, as well as provide needed information for students and other stakeholders for accountability and assessment purposes.

Beyond the evolving expectations about the learning that our students bring with them to campus, faculty continue to expect students to integrate their learning across courses, programs, curricula, and years. Electronic portfolios are a means for bringing the reality of our students' experiences and the expectations of our faculty into a common framework for dialogue and interchange. Faculty can organize and specify the framework and its components, aims, and specifications; students can create and own the content, presentation, and meaning of their work.

We are also confronted with the reality of a mobile student population. Students often attend multiple institutions during their careers, and some enroll in more than one institution at the same time. The ability to transfer evidence of learning from one institution to another, both nationally and internationally, is becoming more and more important for students and for higher education itself as enrollment patterns change and programs of study become less place bound—consider, for example, the growth in online courses and programs. Electronic portfolios provide an easy means for students to transport evidence of learning from one location to another, one course to another, one applied setting to another. In addition, they enable institutions and faculty to see beyond the transcript list of courses, titles, and grades and to delve into the demonstration of learning exhibited by students.

Students can create and own the content, presentation, and meaning of their work.

One of the recent changes in the electronic portfolio landscape has resulted from the emergence of many e-portfolio options for students and institutions. Early in the development of e-portfolios, there were few portfolio packages available, and those that were offered were primarily electronic filing cabinets.

Faculty can design the framework and content of electronic portfolios to meet their individual or institutional outcomes and needs.

Now there are thirty to forty electronic portfolio options available, including products from major commercial vendors as well as open-source alternatives and even free-ware tools such as Google applications. The proliferation of possible tools is a reflection of the emerging popularity and possibilities of electronic portfolios to assist in demonstrating, assessing, and reporting on student learning. Now, faculty can design the framework and content of electronic portfolios to meet their individual or institutional outcomes and needs, while allowing students to create the actual portfolio, and to populate the electronic portfolio with their work. Faculty no longer need to posses great technological expertise in order to engage their students in electronic portfolio presentation and evaluation of learning. Through electronic portfolios students gain technological competence and also enhance their reflective and self-assessment expertise in evaluating their own learning. Electronic portfolios have become affordable options in terms of faculty and student time and energy, and institutional resources.

The multimedia capabilities now built into portfolio frameworks also provide varied and robust ways to capture student learning that build on and move beyond the printed text. As visual and graphical modes of communication become pervasive across society, and as social networking and the explosion of information become inescapable, electronic portfolios allow students and faculty to capture learning in the multitude of ways and places it occurs both inside and outside the classroom or the formal curriculum. The walls around learning have become permeable, and so must our assessment modes for capturing and evaluating learning.

Electronic portfolios also can become powerful modes for reporting on student achievement of learning outcomes for individuals, programs, and institutions. Although reporting on learning through electronic portfolios is in its early stages, efforts are underway to develop ways to convey the rich learning that emerges through portfolios to a broad range of internal and external higher education stakeholders. Beyond the engaging stories that arise from the exploration of student electronic portfolios, such tools as rubrics can provide a means for summarizing learning in ways that can be used to communicate to policy and business leaders. The VALUE rubrics have articulated nationally shared expectations for learning that can be summarized to create a roadmap of learning performance for programs and campuses. Individual campuses have begun to experiment with the development of simple and appealing ways to communicate the results to diverse audiences. (See, for example, Washington State University's Harvesting Gradebook at http://wsuctlt.wordpress.com/2009/01/20/harvesting_gradebook.)

Electronic Portfolios and Student Success: Effectiveness, Efficiency, and Learning presents an overview of the issues and opportunities related to the implementation of electronic portfolios for student learning and assessment. Electronic portfolios have emerged as a powerful means for deepening student

learning and for demonstrating achievement of the broad set of essential learning outcomes needed by today's students.

The electronic portfolio holds the promise of enriching our understanding of learning, communicating the dimensions of that learning, and creating a powerful mechanism for engaging students, faculty, employers, and policy makers in the exploration of what is important for all our students to know and be able to demonstrate for civic discourse, economic health, and global engagement.

TERREL L. RHODES
Vice President for Quality, Curriculum, and Assessment
Association of American Colleges and Universities

Acknowledgments

Electronic Portfolios and Student Success: Effectiveness, Efficiency, and Learning is one of two publications that have emerged from the Valid Assessment of Learning in Undergraduate Education (VALUE) project, which is one component of AAC&U's Liberal Education and America's Promise (LEAP) initiative. Funding for the VALUE project was made available through a grant from the Fund for the Improvement of Post-Secondary Education (FIPSE). Additional funding support was provided by the State Farm Companies Foundation. We in AAC&U's Office of Quality, Curriculum, and Assessment are deeply appreciative of the support and assistance from our grant officer, Krish Mathur at FIPSE. We are also very grateful to Deb Traskell, senior vice president at State Farm Companies Foundation, who has encouraged this work from its inception for its importance in preparing graduates for employment and as contributors to our society and the world.

The VALUE project was guided by an outstanding advisory board whose members brought varied expertise and insights to the project, contributed to lively conversations, and provided valuable guidance for the development and direction of the project process and results. The board included Randy Bass (Georgetown University), Johnnella Butler (Spelman College), Helen Chen (Stanford University), Ariane Hoy (the Bonner Foundation), George D. Kuh (Indiana University), Marcia Baxter Magolda (Miami University), Peggy Maki (education consultant), Veronica Boix Mansilla (Harvard University), Marcia Mentkowski (Alverno College), Gloria Rogers (ABET), Carol Geary Schneider (AAC&U), Robert Sternberg (Tufts University), and Kathleen Blake Yancey (Florida State University).

In particular, we are indebted to a group of diverse campuses using electronic portfolios that agreed at the outset of the project to test a set of VALUE rubrics for assessing student learning on the broad range of essential learning outcomes representative of the learning required to meet the needs of our global existence. These twelve Leadership Campuses—Alverno College, Bowling Green State University, City University of New York La Guardia Community College, College of San Mateo, George Mason University, Kapi'olani Community College, Portland State University, Rose-Hulman Institute of Technology, San Francisco State University, Spelman College, St. Olaf College, and the University of Michigan—tested the VALUE rubrics using electronic portfolios of student work to determine the usability of the rubrics for the assessment of learning. During the rubric development process, almost one hundred additional colleges and universities tested one or more of the rubrics with their own students' work and provided feedback on the usability and usefulness of the rubrics in assessing the quality of student achievement.

None of the rubric development and testing could have been accomplished in this brief time frame without the expert, guiding, and relentless leadership of Wende Morgaine, VALUE initiative manager. Wende coordinated the recruitment of the Leadership Campuses and the rubric development teams,

During the rubric development process, almost one hundred additional colleges and universities tested one or more of the rubrics with their own students' work.

the rubric development process, the testing of the rubric drafts by campuses, the multiple revisions and retesting activities, and the final framing and posting of the rubrics on the AAC&U Web site. Her tireless energy, organizational skills, and ability to engage disparate individuals in a common enterprise was central to the realization of fifteen rubrics for LEAP's essential learning outcomes that faculty and institutions can use to assess student learning in its many dimensions and to communicate with colleagues and students about the terrain of learning as they move through and among our campuses.

Finally, we thank the authors of this volume, two leaders in the student electronic portfolio field who have provided a valuable roadmap for thinking about, implementing, and using electronic portfolios for formative and summative assessment of learning on campus. As always, AAC&U's publications and editorial staff has been collaborative and assiduous in supporting the realization of this publication.

Introduction

Higher education today is more focused than ever on the need to demonstrate how and what students are learning. A recent survey conducted among the membership of the Association of American Colleges and Universities indicates that, currently, 78 percent of colleges and universities have a common set of intended learning outcomes for undergraduates, 72 percent are assessing learning outcomes across the curriculum, and 24 percent are planning for assessment (Peter D. Hart Research Associates 2009). The identification of learning outcomes is an important step in ensuring student success. It encourages the clear articulation of what students are expected to learn, and it leads to consideration of the types of evidence that can best demonstrate whether the expected learning has actually occurred. This step is particularly important in environments where students have diverse learning experiences both inside and outside the classroom, as this diversity can result in a lack of curricular coherence and a fragmented student experience. Clearly articulated outcomes enable the integration of learning as well as foster effectiveness and efficiency in higher education.

There are many different assessment approaches that can be used to gather evidence of student learning and to inform accreditation and accountability efforts. These include common assignments and other embedded assessments, capstone experiences, and commercial tests. Another approach to assessment is represented by the concept of the student portfolio, which draws on longstanding traditions in such disciplines as design, architecture, teacher education, and the arts. As an assessment tool, the student portfolio is unique insofar as it captures evidence of student learning over time—in multiple formats and contexts—documents practice, and includes a student's own reflection on his or her learning. Portfolios also encourage students to represent and integrate their formal and informal learning experiences.

Since 2003, according to the annual technology survey conducted by the Campus Computing Project, higher education institutions from all sectors—including public and private research universities, four-year colleges, and community colleges—have reported steadily increasing investments in electronic portfolio tools and services (Green 2008; Schaffhauser 2009). Electronic portfolios, or "e-portfolios," enable educators to connect information literacy, technological fluency, and domain knowledge (Moore et al. 2007; Reese and Levy 2009).

While currently much discussion of e-portfolios is focused on their role in assessment, our main focus here is on how e-portfolios can be used to support student success, intellectual growth, and individual development within higher education and beyond. Although we address institutional assessment needs, we are primarily interested in the role e-portfolios can play in facilitating student responsibility for and ownership of a full "learning career," the real-life shape of an individual's learning as it develops inside and outside the classroom.

Our main focus here is on how e-portfolios can be used to support student success, intellectual growth, and individual development within higher education and beyond.

The main advantages of e-portfolios lie in the potential benefits they offer students.

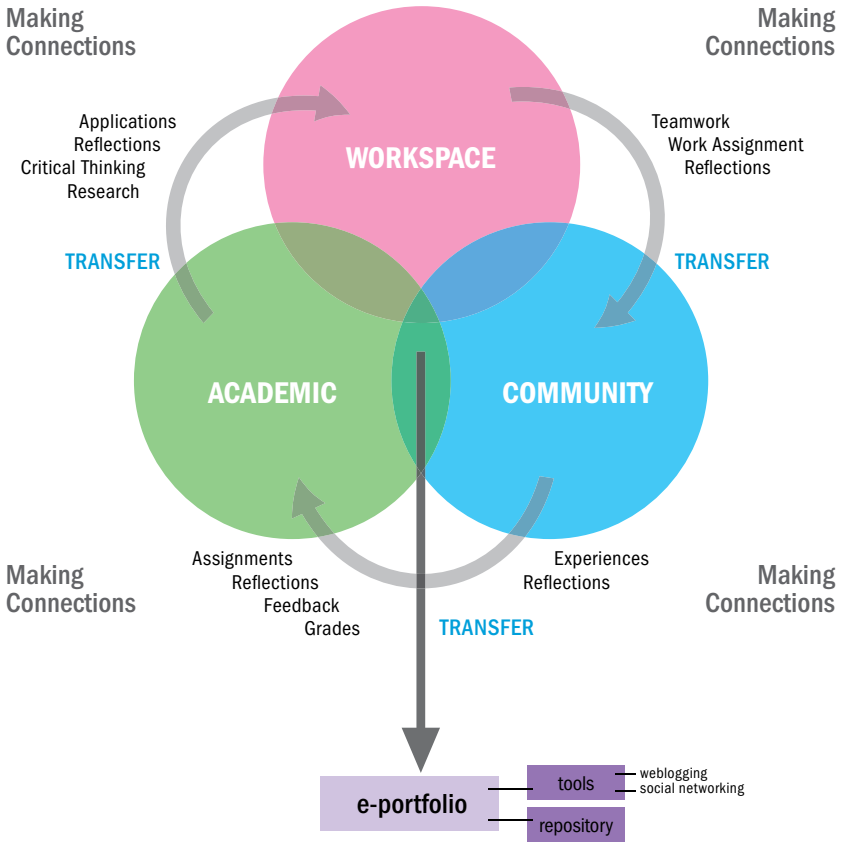
From this perspective, the main advantages of e-portfolios lie in the potential benefits they offer students. These benefits are not limited to the final product—the e-portfolio itself—but also derive from engagement in the process of portfolio creation, from "folio thinking." "Folio thinking" emphasizes the need for structured opportunities to create portfolios as well as opportunities for reflection on the purposes of creating coherence and making meaning (Chen and Mazow 2002; Chen et al. 2005). E-portfolios offer a framework within which students can personalize their learning experiences (student ownership of the e-portfolio and its contents leads to greater responsibility for learning); develop multimedia capabilities to support student-created media; and create different representations of their learning experiences for different audiences. Moreover, unlike other assessment tools, e-portfolios enable students to represent their own

Figure 1. The learning landscape

A Conceptual Framework for E-Portfolios

CONTRIBUTORS: Helen Chen, Tracy Penny Light, David Tosh, Ben Werdmuller

This learning landscape model allows students to view "learning" beyond the rigid structure of degree outlines and requirements while incorporating and overlapping experiences from a variety of learning contexts through social networking with faculty, mentors, peers, and employers



Adapted from Tosh et al. 2006, 27.

learning as well as their interpretations of what Kathleen Yancey (1998) calls the multiple curricula within higher education: the *delivered* curriculum, which is defined by the faculty and described in the syllabus; the *experienced* curriculum, which is represented by what is actually practiced by the student in the classroom; and the *lived* curriculum, which is based on the individual student's cumulative learning to date. At least potentially, e-portfolios provide insight into the curriculum as students have both *lived* and *experienced* it.

E-portfolios—as both process and product—can promote *deep learning* and *knowledge transfer* by fostering the student's ability to make connections between his or her learning experiences in a variety of classroom, workplace, and community settings. This ability of the student to look across his or her learning as he or she progresses through college is particularly important for integrative learning. Indeed, as Huber and Hutchings (2004, 1) note, "one of the greatest challenges in higher education is to foster students' abilities to integrate their learning across contexts and over time. Learning that helps develop integrative capacities is important because it builds habits of mind that prepare students to make informed judgments in the conduct of personal, professional, and civic life. . . ." In other words, an integrative approach to student learning encourages students to take responsibility for documenting and demonstrating their own abilities over time and within a broader learning landscape that encompasses the various domains that comprise their intellectual lives (see fig. 1). This partnership with students in self-assessment can lead to improved efficiency of student services such as academic and career advising.

As "containers" of authentic evidence of student work, e-portfolios can serve as a catalyst for conversations among faculty and other stakeholders within departments and programs about common learning outcomes, coherence among courses, and professional development. For faculty, e-portfolios offer insight into the process by which students learn, rather than just an end product. Until now, the primary mode of documentation has been the academic transcript, the official record of a student's education. Severely limited in detail and richness, a transcript is an incomplete record and cannot represent what students actually learn. As a result, transcripts are of limited use to employers in evaluating prospective employees' potential to succeed (Peter D. Hart Research Associates 2008).

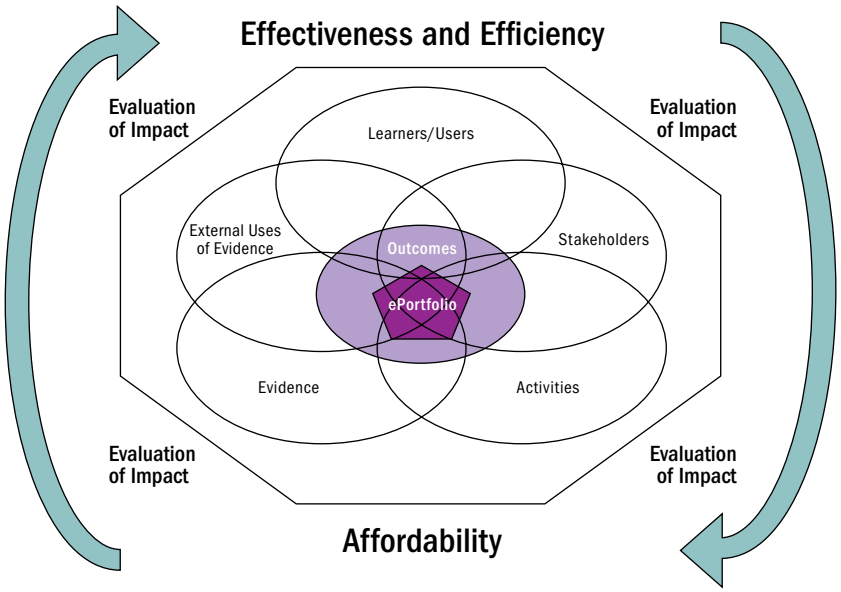
The implementation of e-portfolios to support student success requires careful planning, and a successful implementation plan addresses the following eight issues:

1. Defining learning outcomes
2. Understanding your learners
3. Identifying stakeholders
4. Designing learning activities
5. Including multiple forms of evidence
6. Using rubrics to evaluate e-portfolios
7. Anticipating external uses of evidence
8. Evaluating the impact of e-portfolios

In what follows, each of these issues is explored individually with reference to a series of guiding questions as well as a single, course-level case study that illustrates the implementation process from start to finish. Additional examples of how campuses approach the use of e-portfolios are provided in sidebars. In order to highlight a full range of uses, these examples are drawn from the twelve "leadership campuses" that participated in the Valid Assessment of Learning in Undergraduate Education (VALUE) project of the Association of American Colleges and Universities (AAC&U), which developed national rubrics for essential areas of learning, as well as from a wider international context.

Figure 2 depicts a process for implementing e-portfolios that focuses on evaluating the impact on stakeholders while also assessing the overall achievement of the learning outcomes. The overlapping circles in the figure emphasize the iterative nature of the process: as the implementation project evolves, each of the eight issues identified above is introduced and revisited as appropriate at the individual, course, departmental or program, and institutional levels.

Figure 2. An iterative process for designing and implementing e-portfolios



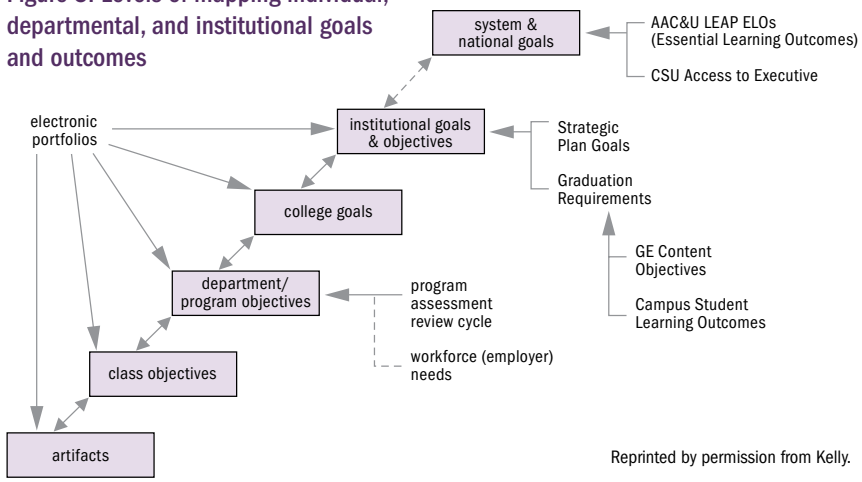
ISSUE ONE: Defining Learning Outcomes

RELEVANT QUESTIONS: *What are the learning goals, outcomes, or objectives associated with your plan to implement e-portfolios? What is the purpose of the e-portfolio? Why use e-portfolios at all? What are you hoping to achieve by introducing e-portfolios? How will e-portfolios enhance the learning experience you are designing for your students?*

The first step in planning to implement e-portfolios is to get down to basics: Why have you chosen e-portfolios, and how do you think they will help you, your class, your program(s), and your students achieve your learning goals? In other words, what is the "value added" of e-portfolios? A good way to start is by considering the stated learning outcomes or objectives for your course or program, or more generally, by thinking about the kinds of learning experiences and "high-impact practices" (see Kuh 2009) you want to make available to your students. Grounding your e-portfolio implementation in a set of stated learning outcomes creates a useful touchstone for later decisions about tools and activities.

Kevin Kelly and Maggie Beers at San Francisco State University advocate that, when articulating learning outcomes, careful consideration should be given to the various stakeholders involved and to the specific learning objectives or standards that are important at all institutional levels (Kelly 2009). This approach emphasizes the need to be aware of the various levels at which outcomes might be articulated and to design e-portfolio projects accordingly. Mapping individual student work, or "artifacts," progressively from individual courses to goals at the departmental or program, college, institutional, system, and national levels (see fig. 3) promotes transparency, accountability, and communication among students, faculty, staff, administrators, and accrediting and professional bodies. AAC&U has provided a broad set of learning outcomes that can be used to launch local discussions (see fig. 4).

Figure 3. Levels of mapping individual, departmental, and institutional goals and outcomes



Reprinted by permission from Kelly.

E-portfolios at Spelman College

Spelman College's Electronic Portfolio Project (SpEl.Folio) has emerged from a tradition of interdisciplinary writing portfolios in the Comprehensive Writing Program into a campuswide initiative that is linked to institutional goals and addresses ongoing concerns about authentic student assessment and meaningful evaluation of students' learning. The stated mission of the project is to "develop students' ability to think critically about the connections among their intellectual, professional, and personal lives." To establish the e-portfolio as an effective tool for learning, it is critical to articulate and synthesize departmental and institutional goals before considering how e-portfolios could help reach them. The implementation of any e-portfolio initiative must be accompanied by a corresponding examination and, potentially, revision of curricula. At Spelman, expanding the SpEl.folio was not only linked to curricular reforms in the college's general education program but also to an administrative effort to clarify the college's statement of purpose, thereby ensuring alignment between the vision of the SpEL.folio and the institutional mission.

E-portfolios at Salt Lake Community College

The general education program at Salt Lake Community College offers liberal arts majors a culminating mathematics course that applies a broad range of mathematical topics to real-world problems. Professor Suzanne Topp uses e-portfolios to guide students through a process for demonstrating their qualitative understanding of quantitative literacy. Individual assignments on topics such as reasoning and finance are accompanied by reflective prompts: What does it mean to use critical thinking skills as they pertain to statistical data and probability? How have your quantitative literacy skills developed through learning about data averages and standard deviations? How has your daily thinking changed now that you understand probability concepts?

Traditional exams limit a student's ability to demonstrate and apply the knowledge he or she has gained. Professor Topp explains the relative advantage of e-portfolios: "I have replaced exams with e-portfolio signature assignments in my Quantitative Reasoning course because I get more insight into the conceptual understanding of the student as well as the student's ability to critically think through a problem by applying the appropriate skills learned in the course."

FIGURE 4. The LEAP Essential Learning Outcomes

Beginning in school, and continuing at successively higher levels across their college studies, students should prepare for twenty-first-century challenges by gaining:

Knowledge of Human Cultures and the Physical and Natural World

- Through study in the sciences and mathematics, social sciences, humanities, histories, languages, and the arts

Focused by engagement with big questions, both contemporary and enduring

Intellectual and Practical Skills, including

- Inquiry and analysis
- Critical and creative thinking
- Written and oral communication
- Quantitative literacy
- Information literacy
- Teamwork and problem solving

Practiced extensively, across the curriculum, in the context of progressively more challenging problems, projects, and standards for performance

Personal and Social Responsibility, including

- Civic knowledge and engagement—local and global
- Intercultural knowledge and competence
- Ethical reasoning and action
- Foundations and skills for lifelong learning

Anchored through active involvement with diverse communities and real-world challenges

Integrative and Applied Learning, including

- Synthesis and advanced accomplishment across general and specialized studies

Demonstrated through the application of knowledge, skills, and responsibilities to new settings and complex problems

Reprinted by permission from Association of American Colleges and Universities 2007. This listing was developed through a multiyear dialogue with hundreds of colleges and universities about needed goals for student learning; analysis of a long series of recommendations and reports from the business community; and analysis of the accreditation requirements for engineering, business, nursing, and teacher education. For more information, please visit www.aacu.org/leap.

Examples derived from a single case study are included here at the end of each issue section to illustrate key points in the e-portfolio process. The first of these, printed below, addresses the need for individual faculty members to design learning experiences in ways that enable students both to meet the intended outcomes of particular courses and to reflect on how those outcomes are applicable within the context of other disciplines. In the example presented in the case study, History and Film is designed not only to meet the particular goals of the course itself, but also to advance the department's goal of teaching historical thinking across the program, the university's goal of developing all students' critical thinking skills, and the wider accreditation goal of preparing students to think critically within and across disciplinary boundaries.

CASE STUDY:

SETTING LEARNING GOALS AND OUTCOMES IN A SECOND-YEAR ELECTIVE HISTORY COURSE

Note: This case study is derived from the experience of Tracy Penny Light at the University of Waterloo in Ontario, Canada. The course described represents just one example of the implementation of e-portfolios at the University of Waterloo in order to move forward the broader institutional goal of enhancing the student experience by promoting integrative learning.

The objectives of the course, History and Film, are presented in the syllabus as follows:

This course has been designed so that you will be able to

- identify how history is interpreted in film;
- work with others to generate ideas about how to "do" history;
- explain how interpretation results from historical memory and historical lenses as evident in films and a variety of other primary and secondary sources;
- critically analyze a variety of historical sources to develop your own interpretation of a topic with a focus on historical memory as a key component of historical analysis;
- reflect on and articulate the process and products of historical analysis and how they may be applied in other learning contexts.

As these course objectives indicate, History and Film was designed to focus students' attention on how they can make connections between the ability to think historically, as fostered by this course, and the critical thinking and analytical abilities they develop in other courses (in both history and other disciplines). The use of e-portfolios provides opportunities for students to reflect within the historical context and then demonstrate how this thinking can be applied elsewhere.

- *Effectiveness*: By identifying clear learning outcomes and sharing them with the students, the instructor ensures that there are clear connections for the students between the course assignments and the course learning goals.
- *Efficiency*: By clearly stating learning outcomes, the instructor will be able to design learning activities that allow the students to achieve the outcomes. In addition, the instructor can show the students how what they are expected to do in the course will enable them to complete the requirements successfully.

E-portfolios at Kapi'olani Community College

To help students incorporate native cultural values into their academic achievement, Kapi'olani Community College has developed an e-portfolio that is grounded in a cultural framework. The Nā Wa`a ("the canoes") e-portfolio uses a voyaging metaphor to frame the student's work relative to the interpretation of the artifact submitted in one of four *pae* levels : growth, building, set sail/traveling, or landed. The purposes of this approach are to assist students in recording their learning; to connect their academic, career, and personal work with various Hawaiian values; and to position this work within a stage of growth. The evidence of academic and personal growth and achievement collected in the Nā Wa`a e-portfolios has been used to inform the development and refinement of rubrics in a broader effort to renew general education at the college.

ISSUE TWO: Understanding Your Learners

RELEVANT QUESTIONS: *Who are your learners? What are their characteristics? What technologies are they comfortable with? What skills do they already possess? What additional support will they need to create their e-portfolios? What milestones or opportunities for reflection already exist? Who will actually be creating the e-portfolio? Who are your e-portfolio users? What are their characteristics? Who owns the e-portfolio?*

For purposes of definition, the learner is the person who will be creating the e-portfolio and who will be engaging in the reflective process of collecting, selecting, and representing his or her work in this medium. It is important to clarify the concept of learner or student ownership up front since it is generally assumed that the author of the e-portfolio has complete ownership of both the format and the content, and is able to set permissions for others to access and share. Institutions can provide students with e-portfolio templates and require that certain assignments and other artifacts be included in the e-portfolio for assessment purposes. Regardless of the approach taken, however, student ownership and voice are critical to the success of e-portfolio initiatives. E-portfolios also allow learners to permit portions of their portfolios to be used to represent or illustrate learning for accreditation purpose or to showcase achievements to other external audiences.

As you consider who your learners are, it is vitally important that you understand not only their characteristics, skills, values, and interests, but also the context of their daily lives. For example, while much has been written about today's "Net Generation," or "Generation M" (for multitasking), we know that we cannot assume that all students are comfortable and facile with technology. Where might an e-portfolio naturally fit into your students' activities and responsibilities, both inside and outside the classroom? The design of Spelman College's e-portfolio project (see appendix A) demonstrates how the e-portfolio can support a student's academic trajectory and also identifies institutional responsibility for e-portfolios at the faculty, departmental, and program levels. If we envision a student's time in college as the beginning of an intellectual "learning career," then at which existing milestones may students already be synthesizing, reflecting, and articulating their experiences for external audiences as well as for themselves?

CASE STUDY:

USING E-PORTFOLIOS AS AN INSTRUCTIONAL MEDIUM

The learners in the History and Film course range from freshmen to seniors and are majoring in a variety of disciplines, including accounting, engineering, science, environmental studies, business, and, of course, history. While some history majors do take this course, the majority of students come from other disciplines. Although admission to History and Film is highly competitive, students typically assume that the course will be "an easy A" because of its focus on film. While most students use technology every day, many claim to be uncomfortable using it for anything beyond basic word processing and, as a result, will need instruction and support in learning how to use the e-portfolio tool. These students view the work they do in the classroom to be very different from the learning that occurs in social, community, or workplace settings. The students often do not take time to reflect on their learning and are unable to articulate connections among learning that takes place in different contexts. This is not because they are incapable of such reflection, but rather because they have not been asked to reflect on their learning or been given opportunities to synthesize and integrate. Their self-identities as "good students" are based primarily on their grades and their work in other disciplines.

- *Effectiveness*: An understanding of the learner's characteristics is important for both the design of activities and the choice of appropriate tools to support those activities.
- *Efficiency*: To ensure support for the learners as they progress through the course, students participate in activities designed to support their learning during class time. By modeling the use of the e-portfolio and visibly demonstrating its value and importance within the course through instructional scaffolding, the instructor is able to spend less out-of-class time providing technical support to the students.

ISSUE THREE: Identifying Stakeholders

RELEVANT QUESTIONS: *Who are the project stakeholders? Who needs to be on board in order to support the users and to ensure the successful implementation, use, and sustainability of the e-portfolio tool? What support is needed by the faculty who guide the creation of the e-portfolio; the department chairs, deans, and other administrators who essentially create the environment in which the e-portfolio is created, purchase the tools, care about what the e-portfolio produces, etc.; and the technology support staff or instructional designers who provide technical support for the use of the e-portfolio?*

There are many stakeholders in any e-portfolio project; however, for purposes of definition, the stakeholders at this stage are the audiences for the individual e-portfolios. Potential stakeholders include both internal audiences (students, faculty and instructors, administrators and other senior leaders, technical support staff, administrative support staff, and alumni) and external audiences (employers, mentors, peers, and family members). The role of stakeholders is a critical one, particularly in determining what factors and resources are necessary to ensure that the implementation is successful. It is essential, as a first step, to engage these various stakeholders through conversations about needs and learning outcomes early in the planning process. Identifying the benefits of e-portfolios for these important audiences can help win their support.

Attention to the various stakeholders also underscores the importance of exploring how e-portfolios might work on a particular campus and within a particular institutional culture by beginning with small-scale, proof-of-concept pilot efforts. Students are among the most important stakeholder groups to persuade of the value of e-portfolios. As part of a pilot project, for example, e-portfolios might be incorporated into a single course, or a class activity that guides students through the "folio thinking" process might be designed. Several institutions, including the University of Washington, Washington State University, and Florida State University, have used student contests as a means not only to publicize the e-portfolio and its different uses (personal/reflective, academic, professional) but also to engage the broader community beyond the institution, including alumni, professionals, and prospective employers. Members of external audiences can be valuable resources, reviewing e-portfolios and providing feedback on learning outcomes. Moreover, the involvement of outside reviewers can help motivate students by providing external credibility to the process and by validating student work.

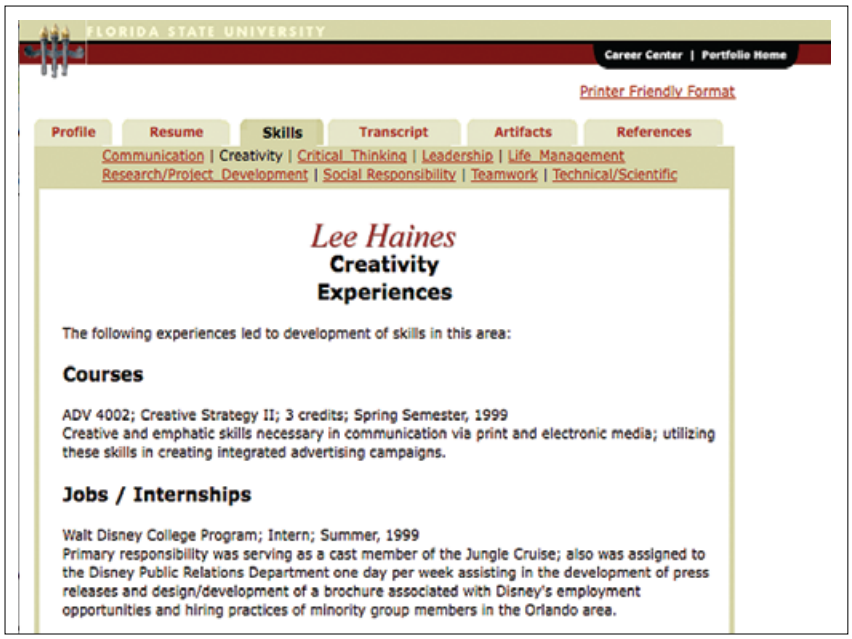
CASE STUDY:

E-PORTFOLIOS AS A MEANS TO ADDRESS STAKEHOLDERS' NEEDS

The pilot e-portfolio used in the History and Film course is part of a larger effort to rethink the curriculum of the history department, with particular attention to how it could better serve both history majors and those students from other disciplines who take history courses to satisfy elective requirements. E-portfolios also are being piloted in several other departments and programs, as part of an institutional strategic plan designed to encourage students to make connections among their learning experiences in various different contexts.

The effectiveness and efficiency of e-portfolios converge around the needs of the stakeholders involved. For the history faculty, for instance, the e-portfolios are a means to gather the evidence needed to understand what knowledge and skills students are taking away from the History and Film course as well as how these competencies can be applied to other fields. For students, e-portfolios provide a space within which to consider the connections between their various learning experiences and to showcase their skills and abilities beyond the walls of the history classroom. The design of the e-portfolio component within this course also meets the needs of both the department and the institution for review and reporting. The efficiencies achieved through the alignment of learning objectives in several departments and programs help make the e-portfolio an especially affordable and effective tool to support learning and student success beyond a single course or department.

Figure 5. Florida State University's career portfolio



Reprinted by permission from www.career.fsu.edu/careerportfolio/enter/output/creativity.html.

E-portfolios in Professional and Vocational Programs

From George Mason University (Nursing) to Bowling Green State University (Education) and the College of San Mateo (Cosmetology) to San Francisco State University (Public Health and Recreation, Parks, and Tourism), e-portfolios have been introduced in a broad range of professional programs. In addition to professional competencies, these programs have identified liberal learning outcomes that students must achieve for credentialing requirements or national standards for licensure. The concept of the e-portfolio resonates in these disciplines because of the e-portfolio's ability to document evidence of skill development and actual practice. For example, oral communication skills can be documented through a video clip and comments from both an external evaluator and the student. The e-portfolio is a means for socializing students into a profession as well as an outlet for capturing and valuing the relevant cross-cutting abilities sought by prospective employers.

Florida State University's career portfolio includes a skills matrix that explicitly guides students in the documentation of experiences that promote the transfer of employable skills across formal and informal learning experiences, including creativity, critical thinking, leadership, life management, social responsibility, teamwork, and technical/scientific skills. Figure 5 shows how a student documents his development of creativity as a learning outcome.

The Australian ePortfolio Project Concept Guides*

The Australian ePortfolio Project identified several stakeholder groups within higher education and developed concept guides that raise and address questions related to the specific needs of each group. The following is a brief overview of some of the key questions and selected issues critical to a successful e-portfolio implementation as they relate to these various stakeholders.

Learners
What do learners need to know about creating and maintaining an e-portfolio?
Critical Issues: Motivation to create an e-portfolio, and how to do it; keeping the e-portfolio up to date; identifying the artifacts and experiences that should be included; accessibility, privacy, and permissions; e-portfolio life expectancy—short term and long term, at the institution and beyond.

Academic Staff (Teachers, Faculty, Instructors)
How can student-centered learning activities be developed to enhance the quality and sustainability of learning outcomes via e-portfolio-based learning?
Critical Issues: Relevance of e-portfolios to personal teaching philosophy and pedagogical approaches; design of curriculum, learning outcomes, assessment; disciplinary concerns; availability of resources, time, support, and recognition of efforts related to the e-portfolio project.

Information Technology and Teaching and Learning Support Staff
What is needed to support academic staff and institutional managers as e-portfolio-based learning is introduced?
Critical Issues: Who will use e-portfolios (scope), and for what purpose; guidance and training needs of learners and teachers; ongoing professional development of academic and support staff; information management for learners and the institution (uploading and organizing artifacts, privacy, security when incorporating e-portfolios into existing learning management systems, authentication of e-portfolio evidence in an academic transcript).

Institutional Managers (Administrators)
What are the key considerations when introducing e-portfolios at the institutional level?
Critical Issues: Institutional policies with respect to e-portfolio ownership, portability, interoperability; fostering buy-in among academics; institutional culture; resource allocation and management; strategic direction with respect to new technologies and alignment of technological tools, pedagogical practices, and institutional mission over the long term.

Employers and Professional Bodies
How can e-portfolios be utilized to enhance employment processes and the career planning and employability of learners, or to support accreditation activities?
Critical Issues: Recruitment and appraisal processes; training needs and career planning; continuing professional development; recognition of prior learning; workforce internationalization; effective documentation of skills and competencies critical for meeting the changing needs of industry.

**The ePortfolio Concept Guides are available online at www.eportfoliopractice.qut.edu.au/information2/toolkit.*

ISSUE FOUR: Designing Learning Activities

RELEVANT QUESTIONS: *How do you design activities to guide what goes into the e-portfolio? What pedagogy, scaffolding, and best practices will guide what goes into the e-portfolio?*

At all stages of the implementation process, it is important to return to the learning outcomes or goals that the e-portfolio project was designed to address. The learning objectives serve to define the expected knowledge, skills, and attitudes that students need to demonstrate in the assignment, course, or program as well as the level of required competency. Reflective practices allow students to provide additional information on attitudes and the affective side of learning, while also encouraging consideration of the relevance and transfer of experiences and skills from one domain to another.

E-portfolio assignments and projects should be designed to guide the work produced by the student so that it is aligned with the stated learning outcomes. Consider how you might provide support for student learning of the "folio thinking" process (also referred to as instructional scaffolding) with prompts and specific tasks that address not only the creation of individual artifacts but also the organization of artifacts over the course of the term. This collection is not meant to be the archetypal shoebox under the bed storing all the "stuff" a student produces during his or her undergraduate education. The value lies not only in the artifacts themselves, but also in the process that creates them and the decision making about what activities are selected as evidence of particular learning outcomes. One goal of the design of these learning activities is to identify and define a structured time and space for the student to reflect on his or her education within the context of an e-portfolio.

The technological features of an e-portfolio can lead to innovation in curricular design and the documentation of learning. For example, while we often think of reflection as a written activity, students can be encouraged to articulate their learning in less traditional ways, such as through videos, digital images, and audio recordings. Pennsylvania State University has explored the use of blogs as e-portfolios, which extends search capabilities by allowing for the tagging of key skills and competencies. The automated collection of meta-information about artifacts (date, author, etc.) can be used with visualization tools to represent the collection of artifacts chronologically or thematically. The digital nature of e-portfolios and the ability to create multiple perspectives on selected representations of learning mean that e-portfolios can be tailored to specific individuals and groups.

In the History and Film course described in the case study sidebars, the instructor developed an in-class activity requiring students to create concept maps that connect the films viewed with the course topic, gender and race in cold war America. This activity not only encouraged students to reflect on their

E-portfolios at the University of Michigan

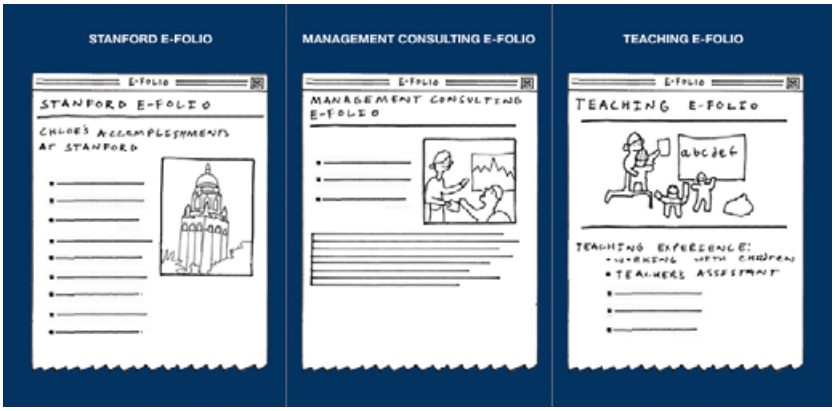
The Integrative Learning and ePortfolio initiative of the University of Michigan includes undergraduate and graduate programs (academic, cocurricular, and living/learning communities) in the schools of dentistry, education, public health, medicine, and social work as well as the university hospital (the Department of Internal Medicine) and administrative units (e.g., the Office of Development). Nearly all these sites are using the Integrative Knowledge Portfolio Framework, which combines generative or reflective learning experiences with the use of e-portfolio tools in order to educate integrative and lifelong learners. Students learn to address the following questions: What and how am I learning? What values, principles, and strengths underlie my work? What gaps or challenges do I experience? How do I apply my knowledge and skills to the real world? How am I making a difference?

Through synthesis, reflection, and dialogue with others, students first learn how to recognize the knowledge, skills, and insights they've gained within a particular context; they then learn how those skills and insights can be applied to other areas of their lives. They also learn to recognize how their work and learning "fit" with, or directly contribute to, larger social issues—that is, how they can influence or change groups, communities, organizations, disciplines, and institutions. By engaging with the Integrative Knowledge Portfolio Framework, students gain a wide variety of tacit (unconscious and informal) and explicit (formal and academic) knowledge and skills; key learning experiences within both academic and real-world contexts; an understanding of the ways in which their identities, values, and beliefs shape their decisions and actions; and awareness of the specific commitments and contributions they are making (or will make) to bring about positive change in the world.

knowledge of history and their ability to think historically, but also nurtured their development of visual literacy skills. Fostering development of a wide variety of abilities is one of the best features of e-portfolios, particularly as students consider their audiences and the evidence needed to demonstrate their learning.

As the example shown in figure 6 indicates, a graduating senior at Stanford University might create an e-portfolio that provides an overview of her overall achievements, another that includes only those experiences relevant to a position in management consulting, and a third that highlights the coursework and extracurricular activities that support her application for a Teach for America fellowship. This increased awareness of audience characterizes a new form of literacy that is rich, complex, engaging, and connected to peers (see findings from the longitudinal Stanford Study of Writing at http://ssw.stanford.edu). E-portfolios can be a means of maintaining integrity in the digital self-representations presented to various audiences across personal, professional, and civic domains (Cambridge, forthcoming). As *Wired* magazine journalist Clive Thompson (2009) points out, "we think of writing as either good or bad. What today's young people know is that knowing who you're writing for and why you're writing might be the most crucial factor of all."

Figure 6. Different e-portfolio views tailored to specific audiences



CASE STUDY:

ACTIVITIES REQUIRING REFLECTION ON COURSE MATERIAL

Over the course of the semester, students are required to complete three reflections on material from the History and Film course. They reflect on what it means to "do" history and on how films are useful in the process of interpreting the past. While all three reflections are ungraded, their completion is required to pass the course. Feedback to the students is modeled and then delegated: the first reflection is read by the course instructor, the second by classroom peers, and the third by the instructor. The instructor communicates the importance of this activity by devoting class time to modeling and enacting the "folio thinking" process as well as by creating concept maps connecting the course to outside sources (see Appendix F, p. 39), which maps are included in the e-portfolios. In the final e-portfolio assignment, students articulate what they have learned about history through film and how "folio thinking" can be useful in other contexts.

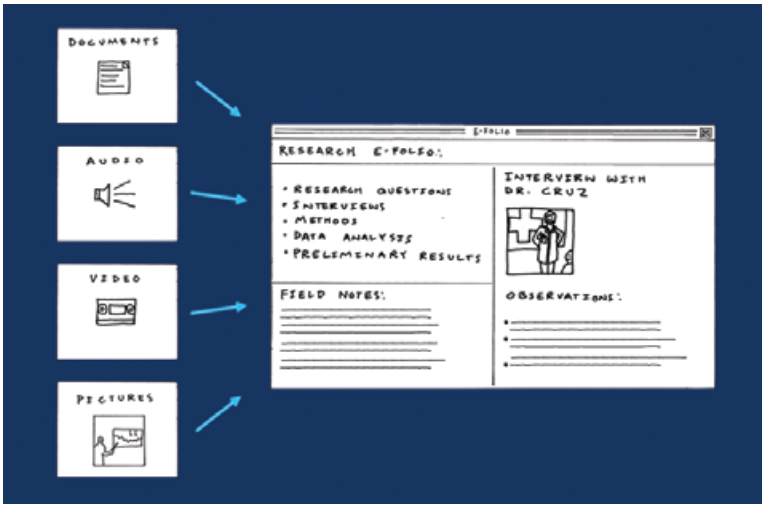
- *Effectiveness*: By designing learning activities that align with course learning outcomes, instructors can support students through their learning with instructional scaffolding, providing them with feedback on their progress, and encouraging them to grow in areas that need further development. The instructor is able more closely to monitor students' progress toward achieving the goals of the course, and is given frequent opportunities to diagnose problems that might impede progress.
- *Efficiency*: By meeting the criteria for effectiveness and affordability, the instructor can ensure that the process of learning and managing the course is efficient for the students and for herself. In other words, there is no "adding-on" of material or activities (what students often call "busywork"); everything has a purpose that is transparent to the learner.

ISSUE FIVE: Including Multiple Forms of Evidence

RELEVANT QUESTIONS: *What constitutes evidence in an e-portfolio? Are the learning outcomes being met? What do the e-portfolio's artifacts show about the student's learning that couldn't be seen before? What does this e-portfolio tell you about the student's learning process? What are the considerations for assessing e-portfolio artifacts and reflections?*

One advantage of the *electronic* portfolio is that it can capture evidence in a range of formats, including written documents, audio recordings, videos, and digital photographs (see fig. 8). The result is a much richer representation of a student's experience. How should instructors address and evaluate this additional onslaught of "data" about their students' learning? How meaningful is the evidence that is captured in e-portfolios?

Figure 8. A multimedia approach to gathering evidence



Alverno College's Digital Diagnostic Portfolio (DDP) is a homegrown, Web-based tool designed specifically to support the college's educational principles and practices within its signature "learning that lasts" framework, which recognizes the complex and enduring ways individuals grow, learn, and express themselves (Mentkowski and Associates 2000). The DDP has been the means by which assignments, assessments, feedback, and self-assessments are collected from students, faculty, and staff. Together with classroom observations, surveys, and interviews, Alverno researchers have conducted close investigations of the relationships among faculty practice, student reflective practices, teaching and learning, and institutional learning outcomes, as facilitated by the DDP. Selected findings suggest that while e-portfolios do provide a specific context for reflection and self-assessment, the use of evidence by students is linked to developmental

changes that need to be iteratively addressed and reinforced by knowledgeable faculty through courses and other academic opportunities (Rickards and Guilbault 2009).

More recently, researchers at George Mason University explored whether patterns in the types of evidence used in e-portfolios demonstrate learning more effectively than other types of evidence (Cambridge et al. 2008). The typology of evidence presented in table 1 provides insight into the ways evidence is used by learners to demonstrate their skills and abilities. The George Mason University study indicates that, while the role of evidence is often assumed to be uniform, the actual use of evidence in e-portfolios is far more complex. This finding has implications for e-portfolio readers as they discern whether the evidence of learning presented by students actually represents intended learning. The George Mason researchers argue that "being able to discuss types and usage of evidence will help educators guide learners in using evidence more intentionally and effectively in their portfolios." In other words, it is important to think about the kinds of evidence students are expected to include as representations of their learning and to design learning activities that support the development of these kinds of evidence. This will make the implementation more effective for both instructors and learners, and more efficient in terms of grading and evaluating assignments.

Table 1. An Emergent Typology of the Use of Evidence in E-portfolios

DIMENSIONS	FRAMES
Characteristics of item used as evidence	**Agency** ▪ Self-authored ▪ Collaboratively authored (portfolio author and associates) ▪ Other-authored **Media** ▪ Media and modality of evidence (e.g., text, audio, image, streaming video, multimedia, etc.)
Purpose of incorporating evidence	**Rhetorical Function** ▪ Intended (or deduced) function of the evidence (e.g., demonstrates or symbolizes) **Object** ▪ Evidence reflects author's knowledge, skills, character traits, beliefs, goals, or identifications
Characteristics of associated learning activity	**Sponsorship** The activity is: ▪ Institutionally sponsored (curricular, cocurricular, community organizations, etc.) ▪ Self-sponsored ▪ Unsponsored **Participation** Evidence indicates: ▪ Individual participation ▪ Group activity ▪ Larger community/associational activity

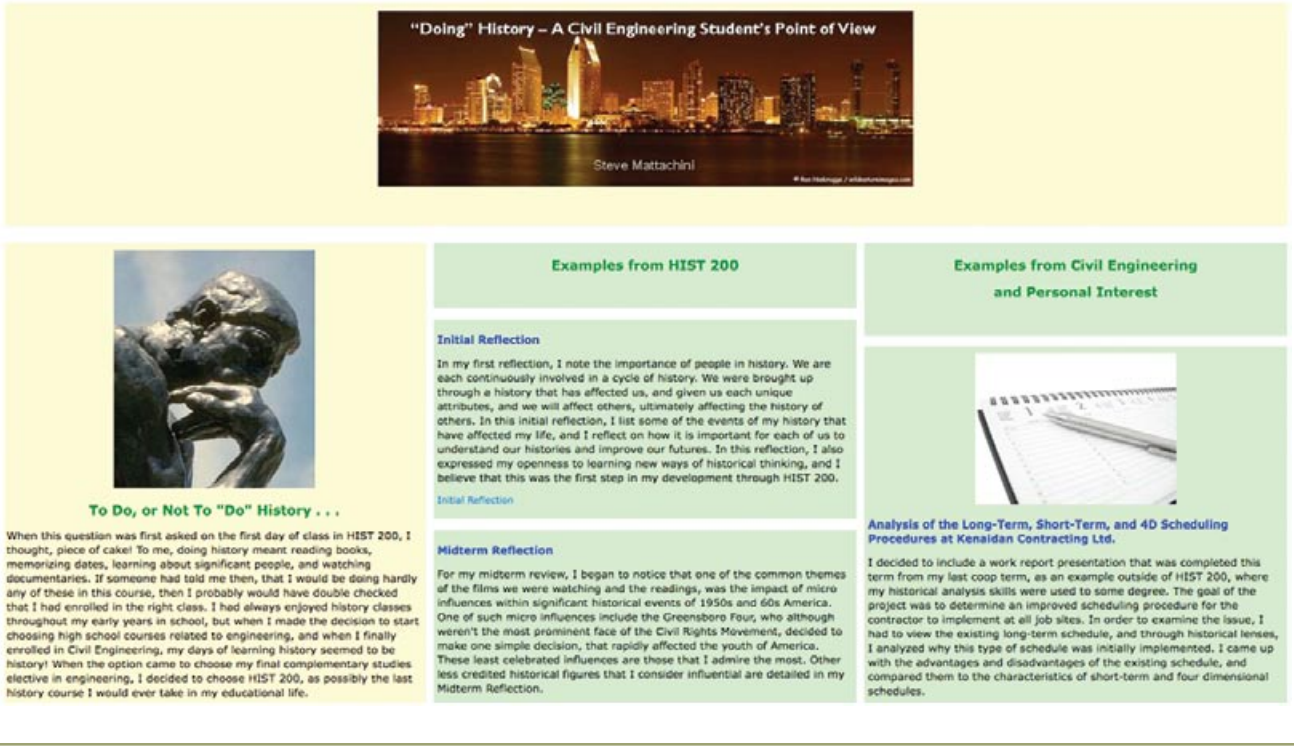
Reprinted by permission from Cambridge et al. 2008.

CASE STUDY:

EVIDENCE OF LEARNING

Given the learning outcomes and the activities of the History and Film course, what evidence of learning can be seen in the e-portfolio? Has the learner cited evidence that truly demonstrates the connections between the type of thinking employed in historical practice and the types of thinking used in other disciplines? The sample e-portfolio below (see fig. 9) includes different types of evidence to demonstrate the connections the learner made between the process of historical thinking as modeled in the course and the thinking involved in civil engineering (his home discipline). The learner conducted research about learning and skill development in civil engineering, and mapped the results to the skills he learned in History and Film. In addition, he articulated the changes in his thinking about history—moving from a view acknowledging that people are important in history, to considering micro-history along with major events, to being a critical interpreter of the past. "Through examples in the films we have watched in class," he notes in his final reflection, "I explain how I have developed from being an acceptor of historical information, to an analyzer of historical information." This student learned to think about history as interpretation and considered how he could use this type of thinking in the "real world."

Figure 9. Sample e-portfolio



ISSUE SIX: Using Rubrics to Evaluate E-portfolios

RELEVANT QUESTIONS: *How do we evaluate e-portfolios? What do e-portfolios say about how and what students are learning? What are the criteria and standards for communicating the expectations for success to students? How can we guide and train e-portfolio reviewers such that they are able to provide useful feedback on the value and meaning of the work to the various stakeholder groups?*

The use of rubrics is an especially powerful approach to understanding artifacts within the e-portfolio and evaluating their relationship to learning activities and stated goals. Rubrics are an important tool for clearly articulating levels of competency in key learning dimensions as well as for communicating the learning outcomes and standards for success to students, faculty, institutional administrators, and members of the broader campus community. Rubrics are not a new tool. Schools and faculty have been developing rubrics for decades for the purposes of grading assignments and evaluating progress in meeting programmatic requirements. Rubrics describe what is valued and rewarded for a given activity, and they foster greater transparency and accountability.

What is new, however, is the emergence of learning outcomes rubrics that represent broadly shared expectations for learning among faculty nationwide. These rubrics were developed and reviewed nationally through AAC&U's campus-based Valid Assessment of Learning in Undergraduate Education (VALUE) project (www.aacu.org/value). Corresponding to the essential learning outcomes described in AAC&U's Liberal Education and America's Promise (LEAP) initiative (see fig. 4, p. 6), the VALUE rubrics offer campuses, departments, disciplines, and programs a useful starting point for discussion of the specific criteria to be used in judging the quality of work for particular outcomes, such as intercultural knowledge and competence and integrative learning (see appendix B).

For those who create them, as well as for their colleagues and students, rubrics are a clear articulation of learning expectations. Rubrics describe what learning looks like at progressively more sophisticated and complex levels of achievement. When utilized with student work collected in e-portfolios, rubrics provide a robust framework for assessing the many dimensions of learning through and across the curriculum and cocurriculum and over time.

The use of the VALUE rubrics for multimedia representations of student work collected via e-portfolios is a fairly new effort within higher education. Nonetheless, experimentation with these rubrics at the institutional, program, and course levels may eventually lead to the identification of unique characteristics of the modes of collecting and presenting e-portfolio evidence and practices for assessment and learning that, regardless of the medium through which learning is demonstrated or where the learning occurs, may prove particularly valuable for enhancing student learning.

E-portfolios at St. Olaf College

The Center for Integrative Studies (CIS) at St. Olaf College requires each student to demonstrate his or her progress through individually designed majors by creating a showcase portfolio. These Web-based portfolios share an underlying emphasis on interdisciplinary, integrative learning. A group of faculty from across the campus piloted the VALUE rubric for integrative learning by assessing a selected group of Web portfolios developed by former CIS majors. The pilot use of the rubric resulted in thoughtful, rewarding, collegial conversations that focused on developing a common definition of integrative learning. While all the participating faculty members had previously overseen individual CIS majors, the shared process of applying the VALUE rubric to actual student portfolios led to a more complex and deeper understanding of the objectives of e-portfolios in CIS and, more generally, the purpose and place of integrative learning at a liberal arts college. Through the consideration of authentic student work, such an exploration of rubrics avails faculty and instructors the opportunity to have concrete, rather than abstract, conversations about programmatic and institutional objectives.

E-portfolios at the Rose-Hulman Institute of Technology

At the Rose-Hulman Institute of Technology, a homegrown tool called the RosE Portfolio System supports the strong integration of student learning outcomes, the curriculum, and assessment. Beginning with curricular maps that identify how individual courses address institutional learning outcomes, evidence of student learning is collected and then evaluated by multidisciplinary teams of faculty portfolio raters at the end of the year. This rating process, detailed by Burnett and Williams (2009), includes a two-day rating session during which predefined evaluation rubrics are used. As part of the training, the rubrics are calibrated to ensure the consistency of ratings from year to year—a vital component of the rating process. Each faculty member must review the rating rubric as well as comments from the team that evaluated the same learning outcome the previous year. From discussions of the rubric itself to comparisons with previously rated student documents, these conversations are grounded in actual student work and become an important context within which faculty from different disciplines can articulate their own understandings of and reflections upon what constitutes evidence of student learning and success.

CASE STUDY:

USING RUBRICS TO COMMUNICATE EXPECTATIONS

After attending a workshop on e-portfolios and a workshop on course redesign, the instructor of History and Film decided that a rubric was important for ensuring that the students in this course had clear expectations about what the e-portfolio was intended to assess. Initially, the students were quite unsure about the e-portfolio as a culminating activity; they were used to written final exams. The rubric was instrumental in helping students understand what they needed to include in the e-portfolio, and it provided the instructor with a means for considering the evidence presented by students in a consistent way. Given the nature of this course, the rubric focused especially on the ability to demonstrate critical thinking, thinking in context (making connections between the course material and other learning experiences), reflective abilities, and the ability of students to learn from one another. All these aspects mapped to the course learning objectives, which were stated at the beginning of the term. In addition, because the instructor was interested in providing an opportunity for students to develop their online presentation skills, categories on presenting information visually with effective navigation were also included. The rubric was provided to the students during the course so they could plan to incorporate these various aspects of their thinking into their final e-portfolios at the end of the class.

ISSUE SEVEN: Anticipating External Uses of Evidence

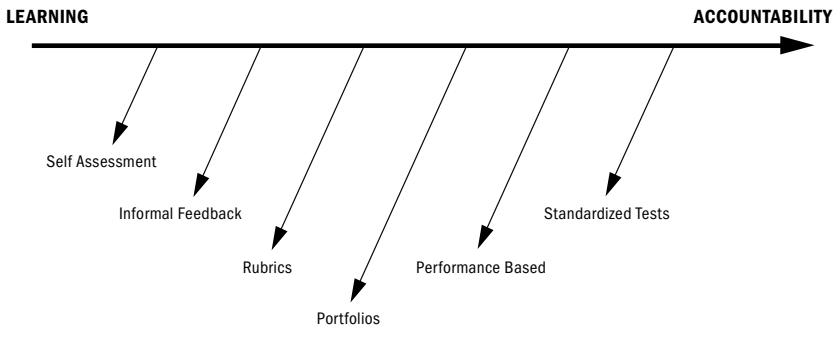
RELEVANT QUESTIONS: *How will the e-portfolio be used by external audiences and stakeholders? How can what is captured in the e-portfolio inform institutional, departmental, and program evaluation, as well as accreditation and research efforts? What does this e-portfolio tell you about the course or institutional experience—content, activities, teaching, department experience, learning environment?*

The content of the student e-portfolio may be most closely aligned with individual course objectives, but nonetheless still useful in informing departmental and program evaluation as well as accreditation and institutional research efforts. The authentic student work collected via e-portfolios can also be linked to other relevant measures of learning and student success, such as the National Survey of Student Engagement, institutional data on pass rates and retention, qualitative feedback from faculty and students, and quantitative surveys of courses, programs, and departments. It may also be useful to build partnerships with institutional researchers, teaching and learning support centers, and other campus units that may regularly collect quantitative and qualitative data about relevant student outcomes.

The work of Evangeline Harris Stefanakis (2002), shown in figure 10, places the e-portfolio on a continuum from learning to accountability, demonstrating its singular contribution as an assessment method relative to other approaches, including standardized tests.

Collecting work in e-portfolios can also be a particularly effective way of capturing insights and demonstrating evidence of educational effectiveness that can later be used to inform program evaluation efforts as well as institutional accreditation. The Western Association of Schools and Colleges uses a rubric to guide the assessment of portfolios for accreditation purposes (see appendix C).

Figure 10. Assessment for learning continuum



Reprinted by permission from Stefanakis 2002, 136.

Triangulation of Institutional Data Sources

Efforts to document the impact of e-portfolios have led institutions such as the City University of New York La Guardia Community College to take advantage of existing institutional data sources, including local and national results from the Community College Survey of Student Engagement (CCSSE), student and faculty feedback, and outcomes data on retention rates. At the end of the semester during the 2005–2006 academic year, feedback questionnaires including selected CCSSE questions were administered in courses that require e-portfolios. Preliminary findings show higher pass rates and increased student engagement for students in these courses relative to college-wide and national means (Eynon 2009). Similarly, Kapi'olani Community College refers to local and national CCSSE benchmarks and administers an inventory of learning and study strategies as a pre-and post-test in order to assess the impact of e-portfolios (Kirkpatrick et al. 2009). Bowling Green State University has shown that e-portfolios can be used to document what student learning looks like linked to grade point average, number of credit hours earned, and persistence (Hakel and Smith 2009).

While this rubric was designed to guide visiting accreditation teams as they examine student portfolios in order to assess program-level learning outcomes, the first criterion ("clarification of students' task") focuses specifically on students' roles and responsibilities in the assessment process. It is essential that the students whose work is being assessed understand not only the purpose and rationale behind the assignment itself, but also the expectations of the faculty and the institution as a whole. This is a key characteristic of a successfully implemented e-portfolio project.

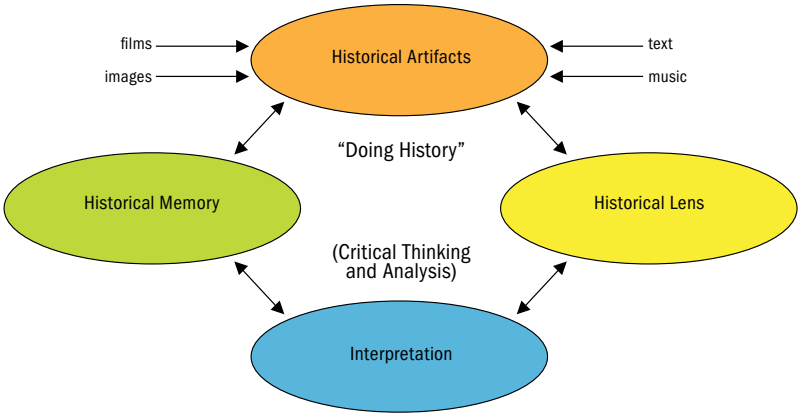
CASE STUDY:

E-PORTFOLIOS AS EVIDENCE OF STUDENT SUCCESS

The student e-portfolios for History and Film were shared with members of the history department during their curricular review. The e-portfolios reiterated the need for the faculty to define more clearly what it means to "do history" as well as to identify the types of activities and instructional scaffolding needed to ensure that all history learners understand this fundamental concept (see fig. 11 below). At the institutional level, these e-portfolios informed a campuswide discussion of how to promote integrative learning and how to use e-portfolios to change the teaching and learning culture in order to foster holistic, cross-course and cross-program thinking, rather than strategic, individual course or program focus.

- *Effectiveness and Efficiency*: By determining early on what other goals might be met by implementing e-portfolios, you can anticipate ways that various stakeholders will use evidence of student learning. For instance, tapping into your institution's strategic planning process may yield insights into how the evidence could be used to support a culture of learning. It may also help in securing the resources needed to implement e-portfolios and allow you to begin developing a community of practice that is comprised of stakeholders interested in pursuing similar goals.

Figure 11. "Doing History"



Reprinted by permission from Light 2008.

ISSUE EIGHT: Evaluating the Impact of E-portfolios

RELEVANT QUESTIONS: *How do you evaluate the implementation of your e-portfolio project? How do you define success? How well did the implementation work? What changes need to be made to ensure that the goals or outcomes identified at the beginning of the project are met?*

To assist with evaluation planning for complex interventions related to information and communications technologies, Richard L. Venezky (2001) designed the "history of the future" exercise. The purpose of the exercise is to ensure that a clear statement of project goals and the means by which these goals are achieved is articulated such that an evaluation plan can reasonably be constructed.

> *Imagine that your intervention project is completed and that it succeeded in all of its goals. You are to appear tomorrow at a press conference to explain what you have accomplished. Write a press release for distributing at this meeting, explaining in a few paragraphs what it is that you have accomplished, who is benefiting from this, why it is important (what problem it solves and why this problem needed to be solved), and what it was that you did that led to or caused this success. (Venezky 2001, 18)*

This exercise encourages project directors to explain exactly what the desired outcome is, why it is important, and how it can be achieved. When it is difficult to articulate the outcomes or their importance, or if there is a lack of consensus among statements from key personnel, further discussion is needed.

The statement of expected outcomes of an e-portfolio project parallels the articulation of learning outcomes and objectives for students. As a result, planning to evaluate the impact of e-portfolios must occur concurrently with the designing of the e-portfolio implementation plan. The focus should be on the goals of the program as a whole and may encompass such areas as the impact on teaching and learning, stakeholder satisfaction, setting budgetary priorities, the choice of an e-portfolio tool, the quality of technological support and training, and the availability of resources and support. It is easy to see that, unless these outcomes are clearly articulated, the e-portfolio project will lack effectiveness, efficiency, and affordability. In other words, if the goals are not present at every stage of the process, it is far less likely that they will be met.

The evaluation effort may also draw upon various sources of data and make use of various collection methods:

ENVIRONMENTAL METHODS

- usage logs showing how often the e-portfolio tool was accessed, the types of activities, and the amount of time spent in the environment
- review of budgets, allocations of funds
- the total number of e-portfolio accounts created

E-portfolios at Portland State University

At Portland State University, three kinds of e-portfolios—student, institutional, and departmental—are united around the common institutional objective to promote student learning, conduct relevant research, and foster community and global engagement. By building on e-portfolios from entering students in the general education program, through departments that have instituted e-portfolios for their majors, the general education capstone portfolios, and an institutional e-portfolio that was used for the regional accreditation self-study, Portland State University has threaded e-portfolios throughout the landscape of the institution. This has enabled analysis of learning and assessment at all levels of the institution and for multiple purposes.

- attendance at e-portfolio training sessions and other e-portfolio community events (e.g., faculty coffees or get-togethers, both face-to-face and online)
- conference presentations, posters, and publications
- press articles and blog postings about the pilot

INDIRECT METHODS

- surveys of faculty and students on various outcomes related to teaching and learning, such as engagement, intention to continue using the e-portfolio, and perceptions of the value and usefulness of the e-portfolio
- post-training evaluations of training sessions
- measures of satisfaction and continuing interest
- interviews with various stakeholders

DIRECT METHODS

- examples of assignments created, reflective prompts
- case studies created from interviews with faculty about how they introduced e-portfolios to their students, what worked and didn't work
- faculty assessment results

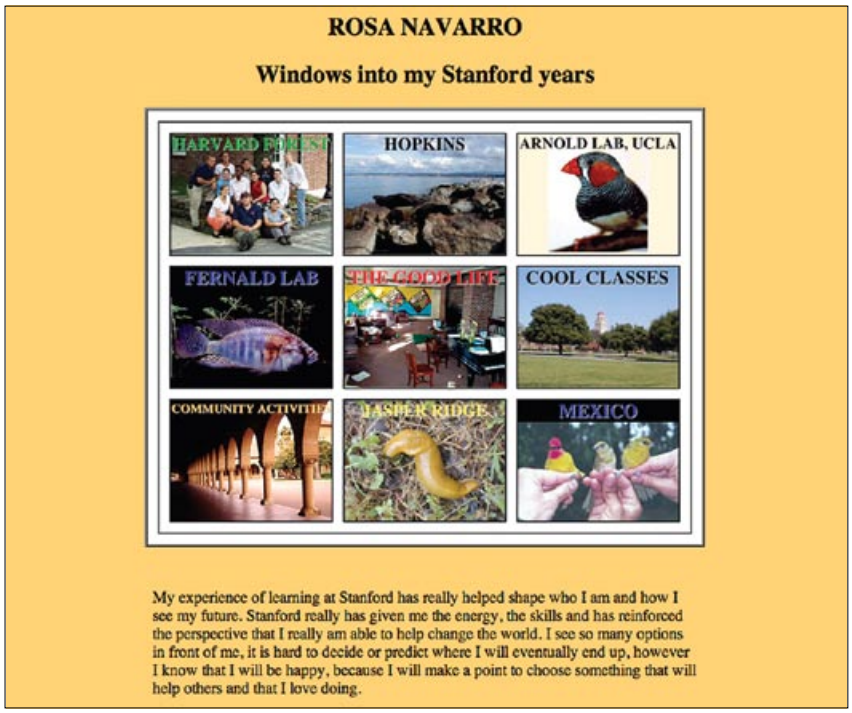
Drawing from these sources to create an evaluation e-portfolio enables the evaluators to organize and examine evidence of impact and success as defined in the "history of the future" exercise. And in doing so, moreover, the evaluators effectively work through the same process students use to gather artifacts into their own e-portfolios. The process of embedding a portfolio approach within an institutional culture, outlined by Ketcheson (2009), highlights potential obstacles (lack of resources, changes in leadership) and significant benefits (improved communication, faculty collaboration). Addressing these can move institutions toward more effective assessment, reflection, and accountability. In other words, by engaging in "folio thinking," the project director and other relevant stakeholders experience the portfolio-creation process in which their students participate.

CASE STUDY:

ONGOING EVALUATION OF IMPACT OF E-PORTFOLIOS ON STUDENT LEARNING

The e-portfolio has now been used in several iterations of History and Film. The effectiveness of this approach to student learning is evaluated each time the course is taught, and lessons learned are incorporated along the way. For instance, in-class activities that allow students to develop their concept-mapping and writing skills were incorporated after the first pilot. Over time, the use of e-portfolios has proved an effective approach to helping students develop the ability to transfer knowledge between contexts. As a result, the course instructor now incorporates "folio thinking" into all her courses. Moreover, as the effectiveness of this approach to student learning became obvious to other stakeholders, the campus as a whole began to promote integrative learning across disciplines.

Figure 12. A Stanford learning career



Reprinted by permission from Rosa Navarro.

E-Portfolios at Stanford University

Figure 12 below presents a snapshot of the front page of a Web-based capstone e-portfolio. Here, a graduating senior with majors in both Spanish and the biological sciences highlights significant experiences from her undergraduate learning career and, in particular, the importance of the research at Stanford that contributed to her desire to pursue a career in teaching science after graduation. Six of the nine experiences she chose to represent as "panes" in her window relate to her interactions in the lab and in the field during the academic year as well as each of the three summers during her undergraduate education. These summer opportunities—studying birds in Mexico after freshman year, working in the Arnold Lab at the University of California–Los Angeles after sophomore year, and conducting field work in the Harvard Forest after junior year—influenced her decision to pursue medical school, rather than graduate school, and her enjoyment of working in the lab, rather than in the field. This e-portfolio offers insight into the impact of her education that an academic transcript simply cannot capture. The Folio Thinking process of creating the e-portfolio and taking the time to make these connections between in-class and out-of-class activities reiterates what Richard Light (2001) has identified as a necessary task for undergraduates to consciously engage in early on in their career.

Concluding Thoughts

Compared with other assessment tools, e-portfolios can capture, represent, and demonstrate learning outcomes more comprehensively. This, in turn, can lead to a more efficient and more meaningful overall assessment system—one that highlights the value of personal reflection and self-assessment for individual students, while also meeting the various assessment needs of faculty, departments, programs, and institutions.

Most institutions may initially adopt e-portfolios for external reasons related to evaluation and accreditation. Yet even in what may begin as an administrative exercise there may still be an opportunity to introduce a learner-centered component. Unlike traditional standardized assessment tools, the e-portfolio offers potential benefits to students as partners in assessment. In other words, e-portfolio assessment is not something that is done *to* students, but rather it is a process in which they have a voice. E-portfolios allow students to develop their ability to assess the strengths and weaknesses of their own learning. This, in turn, leads to a more efficient assessment process that fully engages students and that creates an authentic and timely feedback channel for the educational system as a whole.

The affordability of e-portfolios is related to the hardware and software costs and to the time commitment required of staff, faculty, and students. The technology involved ranges from freely available Web-based tools with which individual faculty can easily experiment in a course, to enterprise-wide solutions that link to the course- or learning-management systems offered by open source communities and by commercial vendors. Table 2 outlines some of the benefits and drawbacks associated with different types of software solutions.

As we have reiterated throughout this publication, the value of e-portfolios lies not in the specific tool itself, but in the process and in the ways in which the concept and the related activities and practices are introduced to students. It is the paradigm or model of a portfolio and the portfolio framework that capture the imagination and that resonate with students, faculty, and other stakeholders, not the technology itself. For instance, the Harvesting Gradebook project of Washington State University's Office of Assessment and Innovation represents an instrument and an assessment process that acknowledges that assignments are completed in diverse ways (e.g., through documents, forum postings, photographs) and places (e.g., in a blog or wiki). Moving away from an institutionally managed e-portfolio or learning management system, the Harvesting Gradebook approach emphasizes embedding assessments wherever learning happens. As a result, the criteria for assessment become more transparent, authentic, and shared among peers, faculty, and industry professionals. Peterson (2009) argues that this approach can effectively transfer the responsibility for assessment from the individual (typically, the instructor) to a distributed community of practice. The Spectrum of Assessment presented in appendix D identifies the various areas that are influenced by this transition and the benefits of this process for all stakeholders.

Guiding Questions for Building a Community of Practice

Cambridge, Kaplan, and Suter (2005) describe the four stages involved in building an effective community of practice, and offer pertinent questions to guide progress through each stage.

Stage 1: Establish a foundation through building relationships of trust, mutual respect, reciprocity, and commitment. *Guiding questions:* How regularly are members interacting? To what extent do interactions have continuity and depth? Are members "opportunistic" about chances to interact in other settings (conferences, etc.)? Are members taking on new leadership roles? How much and what kind of reciprocity is occurring? To what extent is a shared understanding of the community's domain and approach to practice beginning to emerge?

Stage 2: Learn and develop a shared practice, based on an existing body of knowledge. *Guiding questions:* How rich and accessible are the community's knowledge representations for existing practice? To what extent does community design support deeper learning for community members?

Stage 3: Take action as a community to carry out tasks and projects. *Guiding questions:* Are collaborative efforts beginning to emerge naturally? Are there community structures to support volunteering for projects, and working with others? Are members recognized and rewarded for their contributions?

Stage 4: Create and discover new knowledge in the domain. *Guiding questions:* How open is the community to new ideas and leadership? To what extent is the community influential in its domain? Are community members being invited, as community members, to present on leading edge ideas?

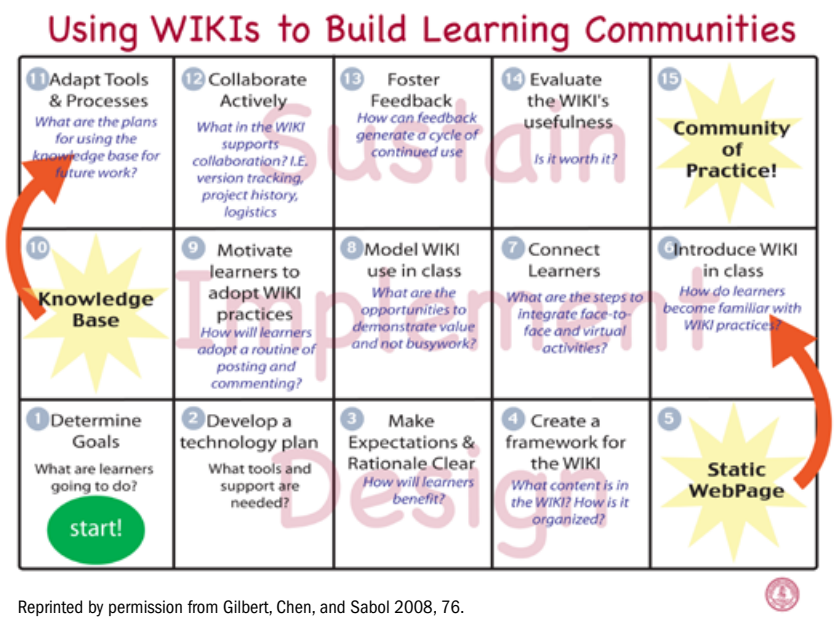
As you move forward in implementing e-portfolios, it is important to keep in mind that, while you may be an entrepreneur and early adopter on your own campus, you join an international community of e-portfolio practitioners who are experimenting with new ideas and approaches and addressing similar challenges and issues. There are many opportunities for both virtual and face-to-face interaction within this active and thriving community. This model of a community of practice may also have value on your own campus as you connect faculty with each other through a Web site (such as a wiki or a blog), online events (such as Webinars or text chats), and face-to-face meetings (such as brown bag lunches, journal clubs, presentations by invited speakers). These kinds of activities can increase the efficiency of an e-portfolio project by fostering networking among pilot participants, the exchange of resources and greater awareness of the initiative both internally and externally, and better documentation and monitoring of the project as it develops.

Table 2. Categories of E-portfolio Systems

TYPE OF SOFTWARE	BENEFITS	DRAWBACKS
Commercial software	No direct software development costs	Licenses must adapt to vendor's pricing structure
	Technical support handled by the vendor	Customer service and technical support may be poor
	Choice of software system	Requests for adaptation may be slow and expensive
	CMS may have built-in ePortfolio solution, offering integrated environment	
Proprietary (in-house) systems	Institution develops exactly what it wants	Development costs can be prohibitive
	No software license fees	May require time and energy to build
	Institution owns intellectual property	High levels of technical expertise required to build and maintain the system
		Need to retain expert staff to sustain and scale the system
Open source ePortfolio software (OSPI)	No charge for open source software	Costs associated with techncial support and maintenance
	Members of OPSI participate in software development	Possibility of open source initiative drying out and/or the community disbanding
	OSPI designed to work with Sakai Project	Software and development may not keep pace with needs
Open source common tools	More creative ePortfolios are possible	Students need web authoring skills
	ePortfolio creators can design and enter artefacts in any way they choose	
	Low software costs	

Reprinted by permission from Australian ePortfolio Project 2008, 7. Support for the original work was provided by the Australian Learning and Teacher Council, an initiative of the Australian Government Department of Education, Employment and Work Relations.

Figure 13. Process for using collaborative tools to design, implement, and sustain a community of practice



Reprinted by permission from Gilbert, Chen, and Sabol 2008, 76.

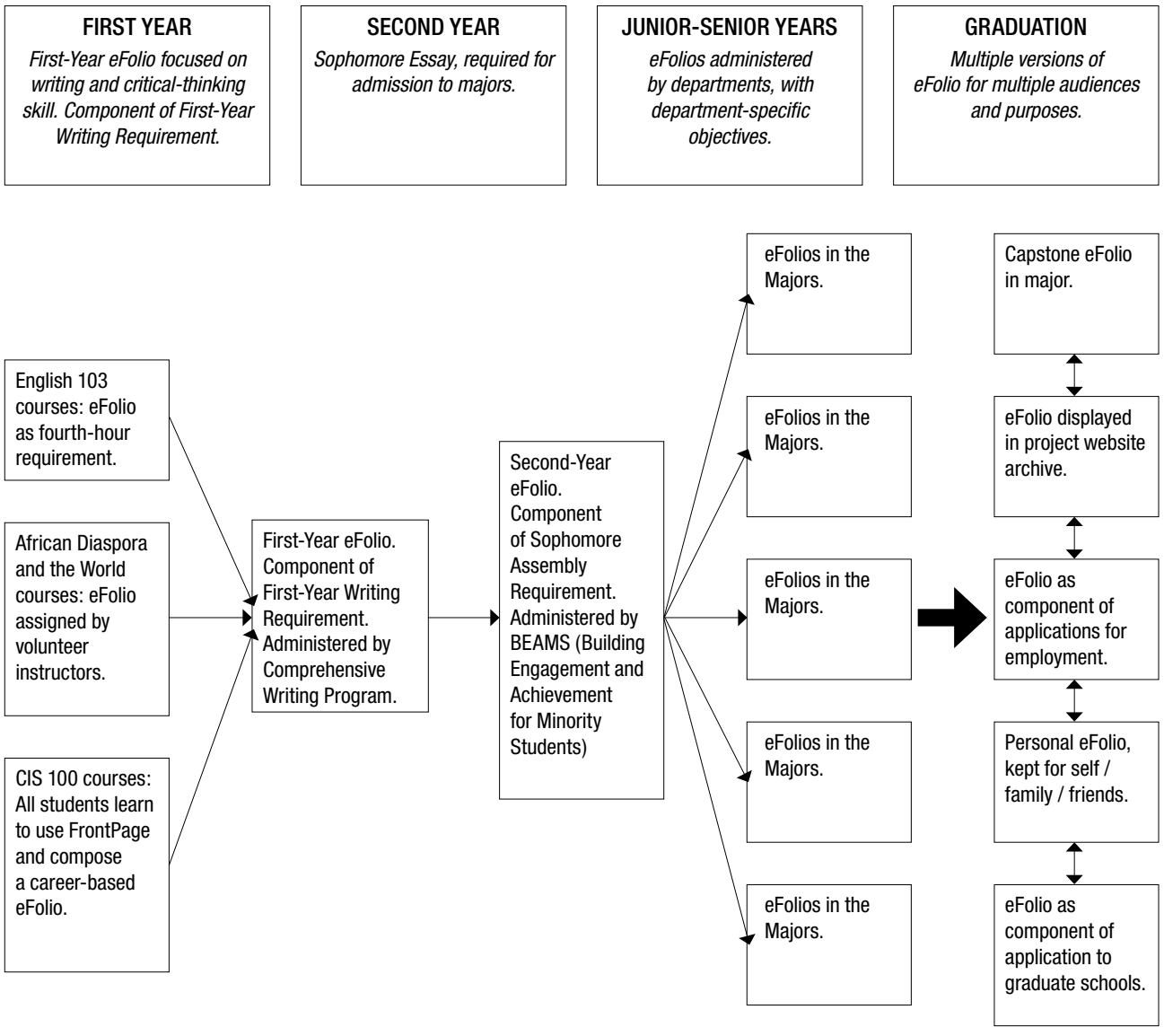
Through online events and face-to-face meetings, Chen and Ittelson (2009) have applied the virtual community of practice framework described by Cambridge, Kaplan, and Suter (2005) specifically to e-portfolios since 2002 in an e-portfolio community of practice known as "EPAC." A dedicated facilitator and the appropriate use of technologies—such as wikis, blogs, and other social networking tools—can support ongoing interactions anytime anywhere. The role of the persistent Web space is illustrated in figure 13, which demonstrates how a wiki (or a project or organizational e-portfolio) can support the efforts of an ongoing learning community.

By following the recommendations outlined in this publication and, particularly, by paying close attention to the articulated goals of the e-portfolio project, educators can consider issues of effectiveness, efficiency, and learning in light of student assessment and institutional accreditation. This approach holds immense promise for learners, guiding them as they become reflective practitioners capable of integrating their learning across contexts and over time. It also provides institutions with authentic evidence of student learning and success.

APPENDIX A:

SpEl.Folio Project Design

Spelman College eFolio Project Design



Reprinted by permission of Margaret Price.

APPENDIX B:

Sample Rubrics from the Valid Assessment of Learning in Undergraduate Education (VALUE) Initiative

VALUE Rubric for Intercultural Knowledge and Competence

E-portfolios also are a useful way to engage the multicultural student population in our classrooms. The "Intercultural Knowledge and Competence" rubric points to core characteristics of learning that can inform e-portfolio preparation and analysis.

FRAMING LANGUAGE

The call to integrate intercultural knowledge and competence into the heart of education is an imperative born of seeing ourselves as members of a world community, knowing that we share the future with others. Beyond mere exposure to culturally different others, the campus community requires the capacity to engage those others meaningfully, to place social justice in historical and political context, and to put culture at the core of transformative learning. The intercultural knowledge and competence rubric suggests a systematic way to measure our capacity to identify our own cultural patterns, to compare and contrast them with others, and to adapt empathically and flexibly to unfamiliar ways of being.

The levels of this rubric are informed, in part, by Milton Bennett's developmental model of intercultural sensitivity.[1] In addition, the criteria in this rubric are informed in part by Darla Deardorff's intercultural framework,[2] which is the first research-based consensus model of intercultural competence. Finally, it is important to understand that intercultural knowledge and competence are more complex than this rubric reflects. This rubric identifies six of the key components of intercultural knowledge and competence, but there are other components as identified in the Deardorff model and in other research.

DEFINITION

Intercultural Knowledge and Competence is "a set of cognitive, affective, and behavioral skills and characteristics that support effective and appropriate interaction in a variety of cultural contexts." (Bennett, J. M. 2008. Transformative training: Designing programs for culture learning. In *Contemporary leadership and intercultural competence: Understanding and utilizing cultural diversity to build successful organizations*, ed. M. A. Moodian, 95-110. Thousand Oaks, CA: Sage.)

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

1 Milton J. Bennett, "Towards Ethnorelativism: A Developmental Model of Intercultural Sensitivity," in *Education for the Intercultural Experience*, ed. R. M. Paige Yarmouth, (ME: Intercultural Press, 1993), 22–71.

2 Darla K. Deardorff, "The Identification and Assessment of Intercultural Competence as a Student Outcome of Internationalization," *Journal of Studies in International Education* 10, no. 3 (2006): 241–66.

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

	CAPSTONE (4)	MILESTONES (3)	MILESTONES (2)	BENCHMARK (1)
Knowledge *Cultural self-awareness*	Articulates insights into own cultural rules and biases (e.g., seeking complexity; aware of how her/his experiences have shaped these rules, and how to recognize and respond to cultural biases, resulting in a shift in self-description).	Recognizes new perspectives about own cultural rules and biases (e.g., not looking for sameness; comfortable with the complexities that new perspectives offer).	Identifies own cultural rules and biases (e.g., with a strong preference for those rules shared with own cultural group and seeks the same in others).	Shows minimal awareness of own cultural rules and biases (even those shared with own cultural group(s)) (e.g., uncomfortable with identifying possible cultural differences with others).
Knowledge *Knowledge of cultural worldview frameworks*	Demonstrates sophisticated understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.	Demonstrates adequate understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.	Demonstrates partial understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.	Demonstrates surface understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy, or beliefs and practices.
Skills *Empathy*	Interprets intercultural experience from the perspectives of own and more than one worldview and demonstrates ability to act in a supportive manner that recognizes the feelings of another cultural group.	Recognizes intellectual and emotional dimensions of more than one worldview and sometimes uses more than one worldview in interactions.	Identifies components of other cultural perspectives but responds in all situations with own worldview.	Views the experience of others but does so through own cultural worldview.
Skills *Verbal and nonverbal communication*	Articulates a complex understanding of cultural differences in verbal and nonverbal communication (e.g., demonstrates understanding of the degree to which people use physical contact while communicating in different cultures or use direct/indirect and explicit/implicit meanings) and is able to skillfully negotiate a shared understanding based on those differences.	Recognizes and participates in cultural differences in verbal and nonverbal communication and begins to negotiate a shared understanding based on those differences.	Identifies some cultural differences in verbal and nonverbal communication and is aware that misunderstandings can occur based on those differences but is still unable to negotiate a shared understanding.	Has a minimal level of understanding of cultural differences in verbal and nonverbal communication; is unable to negotiate a shared understanding.
Attitudes *Curiosity*	Asks complex questions about other cultures, seeks out and articulates answers to these questions that reflect multiple cultural perspectives.	Asks deeper questions about other cultures and seeks out answers to these questions.	Asks simple or surface questions about other cultures.	States minimal interest in learning more about other cultures.
Attitudes *Openness*	Initiates and develops interactions with culturally different others. Suspends judgment in valuing her/his interactions with culturally different others.	Begins to initiate and develop interactions with culturally different others. Begins to suspend judgment in valuing her/his interactions with culturally different others.	Expresses openness to most, if not all, interactions with culturally different others. Has difficulty suspending any judgment in her/his interactions with culturally different others, and is aware of own judgment and expresses a willingness to change.	Receptive to interacting with culturally different others. Has difficulty suspending any judgment in her/his interactions with culturally different others, but is unaware of own judgment.

VALUE Rubric for Integrative Learning

FRAMING LANGUAGE

Fostering students' abilities to integrate learning—across courses, over time, and between campus and community life—is one of the most important goals and challenges for higher education. Initially, students connect previous learning to new classroom learning. Later, significant knowledge within individual disciplines serves as the foundation, but integrative learning goes beyond academic boundaries. Indeed, integrative experiences often occur as learners address real-world problems that are unscripted and sufficiently broad to require multiple areas of knowledge and multiple modes of inquiry, problems for which multiple solutions have been offered and that benefit from multiple perspectives. Integrative learning also involves internal changes in the learner. These internal changes, which indicate growth as a confident lifelong learner, include the ability to adapt one's intellectual skills, to contribute in a wide variety of situations, and to understand and develop individual purpose, values, and ethics. Developing students' capacities for integrative learning is central to personal success, social responsibility, and civic engagement in today's global society. Students face a rapidly changing and increasingly connected world where integrative learning becomes not just a benefit, but a necessity.

Because integrative learning is about making connections, this learning may not be as evident in traditional academic artifacts such as research papers and academic projects unless the student is, for example, prompted to draw implications for practice. These connections often surface, however, in reflective work, self-assessment, and creative endeavors of all kinds. Integrative assignments foster learning between courses or by connecting courses to experientially based work. Through integrative learning, students pull together their entire experience inside and outside of the formal classroom; thus, artificial barriers between formal study and informal or tacit learning become permeable. Integrative learning, whatever the context or source, builds upon connecting both theory and practice toward a deepened understanding.

Assignments to foster such connections and understanding could include, for example, composition papers that focus on topics from biology, economics, or history; mathematics assignments that apply mathematical tools to important issues and require written analysis to explain the implications and limitations of the mathematical treatment; or art history presentations that demonstrate aesthetic connections between selected paintings and novels. In this regard, some majors (e.g., interdisciplinary majors or problem-based field studies) seem inherently to evoke characteristics of integrative learning and result in work samples or collections of work that significantly demonstrate this outcome. However, fields of study that require accumulation of extensive and high-consensus content knowledge (such as accounting, engineering, or chemistry) also involve the kinds of complex and integrative constructions (e.g., ethical dilemmas and social consciousness) that seem to be highlighted so extensively in self-reflection in the arts and the humanities, but they may be embedded in individual performances and less evident. The key to the development of such work samples or collections of work will be in designing structures that include artifacts and reflective writing or feedback that support students' examination of their learning and give evidence that, as graduates, they will extend their integrative abilities to the challenges of personal, professional, and civic life.

DEFINITION

Integrative learning is an understanding and a disposition that a student builds across the curriculum and cocurriculum, from making simple connections among ideas and experiences to synthesizing and transferring learning to new, complex situations within and beyond the campus.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	CAPSTONE (4)	MILESTONES (3)	MILESTONES (2)	BENCHMARK (1)
Connections to Experience *Connects relevant experience and academic knowledge*	Meaningfully **synthesizes** connections among experiences outside of the formal classroom (including life experiences and academic experiences such as internships and travel abroad) to **deepen understanding** of fields of study and to broaden own points of view.	Effectively **selects and develops** examples of life experiences, drawn from a variety of contexts (e.g., family life, artistic participation, civic involvement, work experience), to **illuminate** concepts/theories/ frameworks of fields of study.	**Compares** life experiences and academic knowledge to infer differences, as well as similarities, and **acknowledges perspectives** other than own.	**Identifies** connections between life experiences and those academic texts and ideas **perceived as similar and related** to own interests.
Connections to Discipline *Sees (makes) connections across disciplines, perspectives*	Independently creates wholes out of multiple parts (synthesizes) or draws conclusions by combining examples, facts, or theories from more than one field of study or perspective.	Independently connects examples, facts, or theories from more than one field of study or perspective.	When prompted, connects examples, facts, or theories from more than one field of study or perspective.	When prompted, presents examples, facts, or theories from more than one field of study or perspective.
Transfer *Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations*	Adapts and applies, independently, skills, abilities, theories, or methodologies gained in one situation to new situations **to solve difficult problems or explore complex issues in original ways.**	Adapts and applies skills, abilities, theories, or methodologies gained in one situation to new situations **to solve problems or explore issues.**	Uses skills, abilities, theories, or methodologies gained in one situation in a new situation **to contribute to understanding of problems or issues.**	Uses, in a basic way, skills, abilities, theories, or methodologies gained in one situation **in a new situation.**
Integrated Communication	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) **in ways that enhance meaning**, making clear the interdependence of language and meaning, thought, and expression.	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) **to explicitly connect content and form**, demonstrating awareness of purpose and audience.	Fulfills the assignment(s) by choosing a format, language, or graph (or other visual representation) that **connects in a basic way** what is being communicated (content) with how it is said (form).	Fulfills the assignment(s) (i.e. to produce an essay, a poster, a video, a PowerPoint presentation, etc.) **in an appropriate form.**
Reflection and Self-Assessment *Demonstrates a developing sense of self as a learner, building on prior experiences to respond to new and challenging contexts (may be evident in self-assessment, reflective, or creative work)*	Envisions a future self (and possibly makes plans that build on past experiences that have occurred across multiple and diverse contexts).	Evaluates changes in own learning over time, recognizing complex contextual factors (e.g., works with ambiguity and risk, deals with frustration, considers ethical frameworks).	Articulates strengths and challenges (within specific performances or events) to increase effectiveness in different contexts (through increased self-awareness).	Describes own performances with general descriptors of success and failure.

Reprinted by permission from Rhodes 2010, 51. The full set of VALUE rubrics is also available online at www.aacu.org/value.

The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can by shared nationally through a common dialog and understanding of student success.

APPENDIX C:

Western Association of Schools and Colleges Rubric

WSC

PORTFOLIOS

Rubric for Assessing the Use of Portfolios for Assessing Program Learning Outcomes

Criterion	Initial	Emerging	Developed	Highly Developed
Clarification of Students' Task	Instructions to students for portfolio development provide insufficient detail for them to know what faculty expect. Instructions may not identify outcomes to be addressed in the portfolio.	Students receive some written instructions for their portfolios, but they still have problems determining what is required of them and/or why they are compiling a portfolio.	Students receive written instructions that describe faculty expectations in detail and include the purpose of the portfolio, types of evidence to include, role of the reflective essay (if required), and format of the finished product.	Students in the program understand the portfolio requirement and the rationale for it, and they view the portfolio as helping them develop self-assessment skills. Faculty may monitor the developing portfolio to provide formative feedback and/or advise individual students.
Valid Results	It is not clear that valid evidence for each relevant outcome is collected and/or individual reviewers use idiosyncratic criteria to assess student work.	Appropriate evidence is collected for each outcome, and faculty have discussed relevant criteria for assessing each outcome.	Appropriate evidence is collected for each outcome; faculty use explicit criteria, such as agreed-upon rubrics, to assess student attainment of each outcome. Rubrics are usually shared with students.	Assessment criteria, e.g., in the form of rubrics, have been pilot-tested and refined over time; they are shared with students, and student may have helped develop them. Feedback from external reviewers has led to refinements in the assessment process. The department also uses external benchmarking data.
Reliable Results	Those who review student work are not calibrated to apply assessment criteria in the same way, and there are no checks for inter-rater reliability.	Reviewers are calibrated to apply assessment criteria in the same way or faculty routinely check for inter-rater reliability.	Reviewers are calibrated to apply assessment criteria in the same way, and faculty routinely check for inter-rater reliability.	Reviewers are calibrated; faculty routinely find that assessment data have high inter-rater reliability.
Results Are Used	Results for each outcome are collected, but they are not discussed among the faculty.	Results for each outcome are collected and discussed by the faculty, but results have not been used to improve the program.	Results for each outcome are collected, discussed by faculty, and used to improve the program.	Faculty routinely discuss results, plan needed changes, secure necessary resources, and implement changes. They may collaborate with others, such as librarians or Student Affairs professionals, to improve student learning. Students may also participate in discussions and/or receive feedback, either individual or in the aggregate. Follow-up studies confirm that changes have improved learning.
If e-Portfolios Are Used	There is no technical support for students or faculty to learn the software or to deal with problems.	There is informal or minimal formal support for students and faculty.	Formal technical support is readily available and proactively assists in learning the software and solving problems.	Support is readily available, proactive, and effective. Tech support personnel may also participate in refining the overall portfolio process.

APPENDIX D:

Spectrum of Assessment

Where are you on the spectrum?

Institution-Based Learning	Community-Based Learning
CONTENT	
Intellectual property is protected.	Intellectual property is shared.
LEARNING ACTIVITIES	
The unit of analysis is the course, bounded in time, and brick or virtual (LMS) space.	The unit of analysis is the problem; problems are not bound in time or content.
Problems for students to study are (artificially) constrained by the course and disciplinary boundaries.	Communities identify authentic problems that are inter-disciplinary and reach beyond the definition of the course.
EXPERTISE	
Students learn from faculty within a specific institution.	Learner is the central node; learners include all members of the discourse community (or Community of Practice).
Faculty are the interface between the students and the community of practice.	Students are anticipated to join communities of practice; faculty may introduce students to community.
Faculty retain the social and intellectual capital within both the classroom and the community of practice.	Learning is social and therefore learning builds social capital in communities of practice.
ASSESSMENT CRITERIA	
Faculty members create and ratify the assessment criteria.	Expert consensus from the community of practice validates the assessment instrument and criteria.
Feedback to the students is communicated by, or along with, a letter grade.	Students merit direct and unfiltered feedback from the community using criteria that the community has articulated.
STUDENT WORK	
Students rarely share their work with, or receive feedback from, public audiences	ePortfolios built over multiple years are learner owned and used to communicate with, and get feedback from, wider communities.
CREDENTIALING	
The faculty member is responsible for assessing student work.	The community of practice holds the responsibility for assessment, which is in the form of constructive feedback rather than an authority's judgment.
Institution is the established credentialing authority.	The community of practice is the implicit credentialing authority; the university is the facilitator of that credentialing and of community building.

Assessment is a community effort. Its principle goal is learning, not classifying or sorting.

Washington State University
World Class. Face to Face.

Reprinted by permission from Peterson, Brown, Jacobson, and DesRosier 2009.

APPENDIX E:

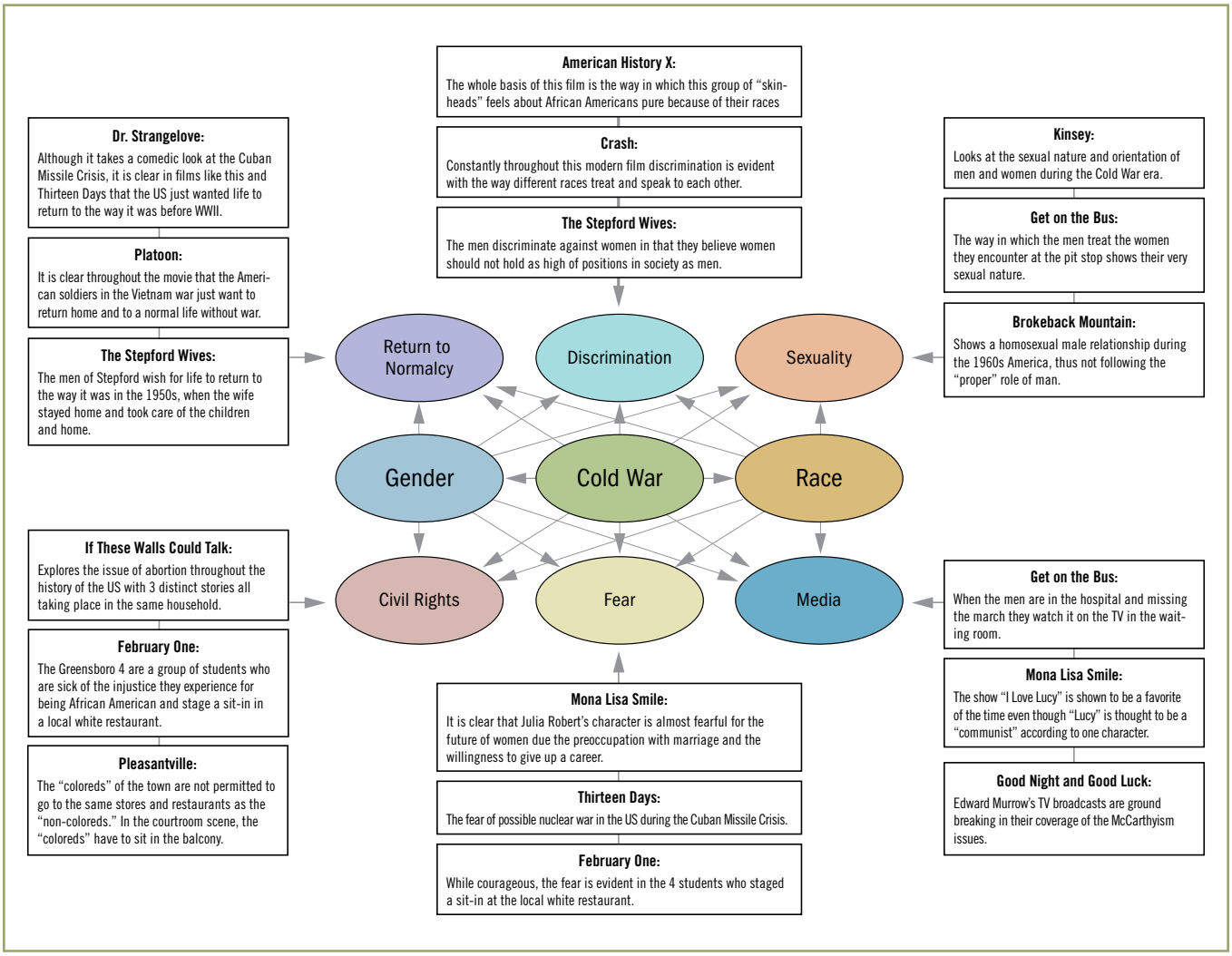
Where to Start Learning about E-portfolios

- **AAC&U's Valid Assessment of Learning in Undergraduate Education (VALUE) Project**
  The VALUE project is designed to define, document, assess, and strengthen student achievement of essential learning outcomes important for all of today's undergraduate students through the development of rubrics.
  Web site: www.aacu.org/value
- **EPAC E-portfolio Community of Practice**
  This international community is free to join and has been a leading resource on electronic portfolios since 2002.
  Blog: www.epaccop.blogspot.com
  Wiki: www.epac.pbworks.com
  Twitter: twitter.com/epaccop
- **Helen Barrett's E-portfolio Resources**
  Dr. Barrett has been a leader in the e-portfolio field since 1991, and her Web site is an excellent starting point for newcomers to the field.
  Web site: www.electronicportfolios.org
- **The TLT Group's Flashlight Evaluation Handbook on Electronic Portfolios**
  The TLT Group addresses the planning and formative evaluation of e-portfolio initiatives and how instructors can use student feedback to figure out how to get even more value from the use of e-portfolios in their courses.
  Web site: www.tltgroup.org/flashlight/Handbook/ePortfolio/ePort_Strat.htm
- **Association for Authentic, Experiential, and Evidence-Based Learning (AAEEBL)**
  AAEEBL, established in 2009, is a global academic association of educational institutions working toward new designs in learning and assessment, increasing connections among the portfolio community, and building the new learning enterprise.
  Web site: www.aaeebl.org
- **Australian ePortfolio Project (AeP)**
  The Australian ePortfolio Project began in 2008 with a thorough examination of current levels of e-portfolio practice in Australian higher education. Now in its second phase, the AeP aims to enhance the use of e-portfolios in Australian universities to benefit individual students as well as the quality of learning and the value of higher education outcomes.
  Web site: www.eportfoliopractice.qut.edu.au
- **European Institute for E-Learning (EIfEL)**
  EifEL, a European professional association, is leading a "Europortfolio" consortium that seeks to establish a place for e-portfolio leadership in Europe.
  Web site: www.eife-l.org
- **The Joint Information Systems Committee (JISC) E-portfolios Overview**
  JISC promotes the innovative use of digital technologies in higher education in the United Kingdom and has supported various projects and created extensive e-portfolio resources.
  Web site: www.jisc.ac.uk/whatwedo/programmes/elearning/eportfolios.aspx

APPENDIX F:

Concept Map of Films and Topics

This example from the case study (see p. 15), is a concept map illustrating the relationship among films and issues in the course. Learning activities that encourage reflection, like concept mapping, allow students to develop both their knowledge of course materials and also nurture other skills like visual literacy.



(Adapted from Rivet in Penny Light, 2008.)

References

Association of American Colleges and Universities. 2007. *College learning for the new global century: A report from the National Leadership Council for Liberal Education and America's Promise*. Washington, DC: Association of American Colleges and Universities.

Australian ePortfolio Project. 2008. *ePortfolio use by university students in Australia: Informing excellence in policy and practice; Final project report*. Brisbane, Australia: Queensland University of Technology.

Burnett, M. N., and J. M. Williams. 2009. Institutional uses of rubrics and e-portfolios: Spelman College and Rose-Hulman Institute. *Peer Review* 11 (1): 24–27.

Cambridge, D. Forthcoming. *Eportfolios for lifelong learning and assessment*. San Francisco: Jossey-Bass.

Cambridge, D., S. Kaplan, and V. Suter. 2005. *Community of practice design guide: A step-by-step guide for designing and cultivating communities of practice in higher education*. http://net.educause.edu/ir/library/pdf/NLI0531.pdf.

Cambridge, D., J. Owen, L. Smith, J. Blank-Godlove, K. Danner, K. Eby, and H. Hare. 2008. *INCEPR Final Report*. George Mason University, http://ncepr.org/finalreports/cohort3/George%20Mason%20Final%20Report.pdf.

Chen, H. L., D. M. Cannon, J. Gabrio, and L. Leifer. 2005. Using wikis and Weblogs to support reflective learning in an introductory engineering design course. American Society for Engineering Education, http://soa.asee.org/paper/conference/paper-view.cfm?id=21365.

Chen, H. L., and J. C. Ittelson. 2009. EPAC: Building a community of practice around e-portfolios. In *The Learning Portfolio*, ed. J. Zubizarreta, 109–119. San Francisco: Jossey-Bass.

Chen, H. L., and C. Mazow. 2002. Electronic learning portfolios in student affairs. *NetResults*, June 16.

Eynon, B. 2009. Making connections: The LaGuardia experience. In *Electronic portfolios 2.0: Emergent research on implementation and impact*, ed. D. Cambridge, B. Cambridge, and K. Yancey, 59–68. Sterling, VA: Stylus.

Gilbert, D., H. L. Chen, and J. Sabol. 2008. Building learning communities with wikis (pp. 71-89). In *Wiki Writing: Collaborative Learning in the College Classroom*, ed. R. E. Cummings and M. Barton, 71–89. Ann Arbor, MI: University of Michigan Press.

Green, K. 2008. *Campus Computing 2008: The 19th National Survey of Computing and Information Technology in American Higher Education.* Encino, CA: Campus Computing Project.

Hakel, M. D., and E. N. Smith. 2009. Documenting the outcomes of learning. In *Electronic portfolios 2.0: Emergent research on implementation and impact*, ed. D. Cambridge, B. Cambridge, and K. Yancey, 133–6. Sterling, VA: Stylus.

Huber, M., and P. Hutchings. 2004. *Integrative learning: Mapping the terrain.* Washington, D.C.: Association of American Colleges and Universities.

Kelly, K. Mapping eportfolio artifacts to objectives at different levels. California State University, http://teachingcommons.cdl.edu/eportfolio/resources/dop/mapping.html.

Kirkpatrick, J., T. Renner, L. Kanae, and K. Goya. 2009. A values-driven eportfolio journey. In *Electronic portfolios 2.0: Emergent research on implementation and impact*, ed. D. Cambridge, B. Cambridge, and K. Yancey, 97–102. Sterling, VA: Stylus.

Kuh, George. 2009. *High-impact educational practices: What they are, who has access to them, and why they matter.* Washington, D.C.: Association of American Colleges and Universities.

Light, T. P. 2008. Making connections: Developing students' historical thinking with electronic portfolios. *Academic Intersections* 2, http://edcommunity.apple.com/ali/story.php?itemID=14182.

Mentkowski, M., and Associates. 2000. *Learning that lasts: Integrating learning, development, and performance in college and beyond*. San Francisco: Jossey-Bass.

Moore, A. H., S. B. Fowler, B. K. Jesiek, J. F. Moore, and C. E. Watson. 2009. *Learners 2.0? IT and 21st-century learners in higher education*. Boulder, CO: EDUCAUSE Center for Applied Research.

Peter D. Hart Research Associates. 2008. *How should colleges assess and improve student learning? Employers' views on the accountability challenge: A survey of employers conducted on behalf of the Association of American Colleges and Universities.* Washington, DC: Association of American Colleges and Universities.

———. 2009. *Learning and assessment: Trends in undergraduate education; A survey among members of the Association of American Colleges and Universities.* Washington, DC: Association of American Colleges and Universities.

Peterson, N.2009. Harvesting Gradebook. http://wsuctlt.wordpress.com/2009/01/20/harvesting_gradebook/.

Peterson, N., G. Brown, J. Jacobson, and T. DesRosier. 2009. Authentic assessment of learning in global contexts. Presentation at the annual meeting of the Association of American Colleges and Universities, Seattle.

Reese, M., and R. Levy. 2009. *Assessing the future: E-Portfolio trends, uses, and options in higher education*. Boulder, CO: EDUCAUSE Center for Applied Research.

Rhodes, T. L., ed. 2010. *Assessing outcomes and improving achievement: Tips and tools for using rubrics*. Washington, DC: Association of American Colleges and Universities.

Rickards, W., and L. Guilbault. 2009. Studying student reflection in an electronic portfolio environment: An inquiry in the context of practice. In *Electronic portfolios 2.0: Emergent research on implementation and impact*, ed. D. Cambridge, B. Cambridge, and K. Yancey, 17–28. Sterling, VA: Stylus.

Schaffhauser, D. 2009. Here, there, and everywhere. *Campus Technology*, http://campustechnology.com/Articles/2009/11/01/ePortfolios.aspx?p=1.

Stefanakis, E. H. 2002. *Multiple intelligences and portfolios: A window into the learners' mind*. Portsmouth, NH: Heinemann.

Stefani, L., R. Mason, and C. Pegler. 2007. *The educational potential of e-portfolios: Supporting personal development and reflective learning*. New York: Routledge.

Thompson, Clive. 2009. Clive Thompson on the new literacy. *Wired*, www.wired.com/techbiz/people/magazine/17-09/st_thompson.

Tosh, D., B. Werdmuller, H. L. Chen, T. P. Light, and J. Haywood. 2006. The learning landscape: A conceptual framework for ePortfolios. In *Handbook of research on ePortfolios*, ed. Ali Jafari and Catherine Kaufman, 24–32. Hershey, PA: Idea Group Inc.

Venezky, R. L. 2001. Procedures for evaluating the impact of complex educational interventions. *Journal of Science Education and Technology* 10 (1): 17–30.

Western Association of Schools and Colleges. *Portfolios: Rubric for assessing the use of portfolios for assessing program learning outcomes*, www.wascsenior.org/findit/files/forms/PortfolioRubric4_08.pdf.

Yancey, K. B. 1998. *Reflection in the writing classroom*. Logan, UT: Utah State University Press.

About the Authors

HELEN L. CHEN is a research scientist at the Stanford Center for Innovations in Learning within the Human Sciences Technologies Advanced Research Institute at Stanford University. She earned her PhD in communication with a minor in psychology from Stanford University in 1998, and her BA in communication studies from the University of California–Los Angeles in 1993. In her current position, Helen leads the evaluation efforts to document and disseminate the innovations in teaching and learning occurring in the technology-augmented classrooms in Stanford's Wallenberg Hall. Her research interests range from academic and professional persistence in engineering education, to the pedagogy and practices associated with electronic learning portfolios (e-portfolios) and social software tools that support teaching, learning, and assessment. Helen is a founding member and co-facilitator of EPAC, an international virtual community of practice focused on e-portfolios. She is also a member of the national advisory board for the Valid Assessment of Learning in Undergraduate Education (VALUE) project and serves on the faculty of AAC&U's annual Institute on General Education.

TRACY PENNY LIGHT is assistant professor of sexuality, marriage, and family studies and of history at St. Jerome's University in the University of Waterloo (Canada). Before joining the faculty of St. Jerome's in 2007, she followed an unconventional academic path by working in the areas of faculty development and instructional technologies. She served as instructional project manager for the associate vice president for learning resources and innovation at the University of Waterloo (UW), where she managed strategic learning projects on the UW campus. Tracy also served as acting associate director of the Teaching Resources Office (now the Centre for Teaching Excellence) and helped manage organizational change at UW. She continues to work with individuals and institutions to implement integrative learning in their courses and on their campuses, which has included co-facilitating a summer institute on e-portfolios at Stanford University. Her research interests include exploring new pedagogies that promote deep learning and historical thinking, how e-portfolios can support reflective and integrative learning across learning contexts and in a variety of disciplines, and how medicine constructs gender and sexuality in Canada and the United States.

About the Association of American Colleges and Universities (AAC&U)

AAC&U is the leading national association concerned with the quality, vitality, and public standing of undergraduate liberal education. Its members are committed to extending the advantages of a liberal education to all students, regardless of academic specialization or intended career. Founded in 1915, AAC&U now comprises 1,200 member institutions—including accredited public and private colleges and universities of every type and size.

Through its publications, meetings, public advocacy, and programs, AAC&U provides a powerful voice for liberal education. AAC&U works to reinforce the commitment to liberal education at both the national and the local level and to help individual colleges and universities keep the quality of student learning at the core of their work as they evolve to meet new economic and social challenges. With a ninety-year history and national stature, AAC&U is an influential catalyst for educational improvement and reform. For more information, visit www.aacu.org.

ISBN 978-0-911696-69-1

Association of American Colleges and Universities

1818 R Street NW, Washington DC, 20009
www.aacu.org