Multiple purposes of ePortfolios in higher education: a case study of one department

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Multiple purposes of ePortfolios in higher education:  
A case study of one department

by

Lesya M. Hassall

A dissertation submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

Major: Education (Curriculum and Instructional Technology)

Program of Study Committee:
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Iowa State University
Ames, Iowa
2007

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Faculty Participants

Student Participants

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ABSTRACT

This case study was designed to investigate how the multiple purposes of ePortfolios in support of learning, program assessment, and institutional accountability were expressed in one department. The research site was purposefully identified: the most mature constituency of the eDoc electronic portfolio system initiative at Iowa State University (ISU), the Department of Food Science and Human Nutrition (FSHN), integrated the practice of ePortfolios in its undergraduate curriculum to track student progress, assess the quality of its programs, and prepare for accreditation.

A qualitative interpretive approach was adopted for this research. Rich in content and depth, data were collected from a variety of sources, including semi-structured interviews with the students and faculty members (both instructors and administrators); student electronic portfolios; course, program and departmental documentation; observations; and participant feedback. Process tracing through lateral and vertical iteration was the analytical procedure employed in this study.

The major research outcomes of this study are as follows:

1. **Multiple purposes of support for learning, program assessment, and institutional accountability created a tension in this department that was triggered by:**
   a. Perceptual differences for portfolio development in students and faculty.
   b. Student and faculty differences in understanding portfolio purposes.

2. **This tension was recognized and regulated through:**
   a. Entrepreneurial activities of those faculty members who were enthusiastic about ePortfolios.
   b. Leveraging grass root movement and administrative support for portfolio development in the department.

The implications of this research emphasize the importance of embedded curriculum, active participation of all stakeholders, leverage of grassroots and administrative support and attention to irreconcilable differences of portfolio purposes for successful ePortfolio development.
CHAPTER 1: INTRODUCTION

Broadly defined, ePortfolios are purposeful collections put together by their owners who draw upon their archives of multimedia artifacts to present evidence of their learning activities to different audiences. Such collections are necessarily accompanied by reflective rationales explaining the selection and presentation of portfolio contents. Thus, ePortfolios can be used for different purposes.

ePortfolios are permeated with multiple meanings. Defined as both processes and products (Hartnell-Young, 2006), ePortfolios are associated with online repositories of multimedia records owned and managed by learners who make decisions about portfolio contents, structures, purposes, and access (Becta, 2007). ePortfolios provide both the electronic space for storage and management of artifacts to demonstrate achievement and growth over time and the intellectual space for learners to engage in metacognition and collaboration. The multipurpose character of ePortfolios is imbued with the values of the educational systems in which these technologies are practiced.

Statement of the Problem

The multiple purposes of support for learning, program assessment, and institutional accountability have been embedded in the practice of electronic portfolios\(^1\) in higher education (Barrett, 2004a; Fagin, Hand, & Boyd, 2004). Perceived as a demonstration of student competency (Georgi & Growe, 1998), portfolios have been employed to support self-evaluation, program evaluation, and external evaluation, each of which requires different types of evidence to be collected and included in the portfolio content (Barnett, 1995). Accordingly, electronic portfolios and their antecedents, traditional (paper-based) portfolios, have been implemented for three major reasons: to make individual learning visible, to help programs and institutions identify areas that need improvement, and to demonstrate the

\(^1\)Electronic portfolios is the term to be used throughout this work as an umbrella for e-Portfolios and e-Folios; see the Working Vocabulary at the end of this chapter. ePortfolios are dynamic personal online spaces that are part of a system (Becta, 2007); e-Folios are static webpages accessible from the web, disk, CD-ROM, DVD, and/or similar transportable media.
alignment of curriculum and student outcomes with state and national standards (Strudler & Wetzel, 2005).

Dynamic electronic portfolios integrated into curriculum and accessible from the Web (ePortfolios) have given rise to promises to support learning, program assessment, and institutional accountability (Love, McKeen, & Gathercoal, 2004). Many institutions have been implementing ePortfolios to embrace such purposes. Clayton State University College of Business (iWebfolio, 2003) views the purposes of their Performance Evaluation Portfolio Program as twofold: to demonstrate student business knowledge and skills and to help the school meet the mission of providing quality undergraduate education in business administration to traditional and nontraditional students.

Similarly, the eFolio Minnesota system (n.d.), used by Minnesota State Colleges and Universities, encourages publishing and sharing student portfolios that contain evidence of academic achievement. The other functions embedded in the eFolio Minnesota system are associated with students reflecting on their school accomplishments and educators using electronic portfolios for documentation, facilitation, and evaluation of learning.

The Digital Assessment Portfolios (DMAP) project at Queensland University of Technology (2004) purports to: (a) identify the qualities of knowing across the five art forms (drama, dance, visual arts, media, and music), (b) identify the gaps in assessment of such qualities in current approaches to arts assessment, (c) conceptualize ways in which digital technologies can be used in arts assessment to overcome inadequacies in current approaches, and (d) take optimum advantage of the capacities of digital technologies to facilitate learning (Dillon & Nalder, 2003).

ePortConsortium (2007), an association of individuals from 25 countries and more than 500 higher education and instructional technology (IT) commercial institutions involved in the development of academic ePortfolio software systems, envisions such portfolio purposes as making student learning visible, providing a framework for assessing academic

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2 The Portfolio Clearinghouse website (http://ctl.du.edu/portfolio-clearinghouse/search_portfolios.cfm), developed jointly by the American Association for Higher Education and the University of Denver, Center for Teaching and Learning, lists 32 U.S. educational institutions engaged in the initiation and implementation of e-Portfolios; the listing also includes four organizations outside the U.S.
progress, demonstrating student attainment of program or certification requirements, and facilitating professional development and life-long learning.

Although ePortfolios have numerous advocates, they have not yet become a mainstream higher education technology (Lorenzo & Ittelson, 2005), because their potential to support the multiple purposes of learning, program assessment, and institutional accountability is not yet thoroughly understood. Empirical research has documented that such multiple purposes bring a tension to portfolio development (Carney, 2001; Placier, Fitzgerald, & Hall, 2001; Snyder, Lippincott, & Bower, 1998). When sought to be used for learning by their authors, portfolio contents were found inadequate by external evaluators who were driven by high-stake purposes (Barrett & Carney, 2005). Additional tension is created when student portfolios, claimed to be used for programmic purposes to collect evidence of the quality of educational experiences offered by programs and institutions and identify areas that need improvement, become expressions of institutional outcomes to measure institutional performance.

An examination of the promise of electronic portfolios to reconcile multiple purposes presents an interesting discussion for a number of reasons. First, in response to accountability demands placed on educational establishments by accreditation agencies and state government (Angelo, Ewell, & Lopez, 1999), concerns have been voiced as to the lack of attention paid to ePortfolios as powerful tools to support learning for high-stake purposes (Barrett, 2004a; Barrett & Carney, 2005). Portfolio owners, being acutely aware of high-stake purposes, are forced to represent themselves in ways that do not reflect their learning and identity.

Second, questions have been raised about whether ePortfolios represent an official record of student work (Lorenzo & Ittelson, 2005), and, if so, whether a professional evaluation to validate portfolio contents is needed. Evaluation is associated with the institutional function to measure student learning outcomes against prescribed standards. Updating or changing their electronic portfolios as the result of feedback, students alter the official character of their record. The tension between multiple purposes then surfaces as institutions are struggling to meet the psychometric standards of validity, reliability, fairness,
and absence of bias (Wilkerson & Lang, 2003), while simultaneously striving to deliver formative feedback to learners.

Third, electronic portfolios may become subject to standardization (Siemens, 2004). On the premise that interoperability needs to be built into the portfolio structure to permit portfolio development and sharing within and across programs and institutions, electronic portfolio technologies can become institution-centered and controlled; this compromises portfolio reflective and learning functions.

Research to gain insight into how the multiple purposes of support for learning, assessment, and accountability find expression in ePortfolios can yield useful knowledge as to how portfolios may enhance student reflection and learning, structure program assessment, and nurture institutional accountability.

**Purpose of the Study**

This dissertation research examines one department’s implementation of an electronic portfolio system (ePortfolios) to identify ways in which the multiple purposes of support for learning, program assessment, and institutional accountability are realized in the portfolio practice in higher education. The researcher sought an understanding of the following:

1. the ways in which the department implemented the electronic portfolio system to support student learning;
2. the ways in which the department implemented the electronic portfolio system as a vehicle for program assessment and improvement,
3. the ways in which the department implemented the electronic portfolio system to support accountability;
4. the ways in which these purposes worked together and/or against each other.

This study aimed to elucidate and interpret the factors and mechanisms that impacted the way these multiple purposes were perceived, acknowledged, and approached by the department. The study also purported to examine and interpret a range of theoretical and practical research on electronic portfolios in order to provide recommendations to academic programs and higher education institutions implementing electronic portfolio systems.
Research Questions and Design

This research addressed the following overarching research question: How do the multiple purposes of support for learning, program assessment, and institutional accountability find expression in the practice of ePortfolios in higher education? Four questions touching upon the aspects of learning, assessment, and accountability guided this study:

1. How do ePortfolios support learning?
2. How do ePortfolios support program assessment?
3. How do ePortfolios support institutional accountability?
4. How do these multiple purposes co-exist and work together and/or against each other?

This research used a qualitative interpretive approach and case-study methodology to examine the practice of electronic portfolios for multiple purposes in the Department FSHN at ISU. This research site was chosen as representing the most mature use of electronic portfolios within the eDoc project, a campus-wide Web-based electronic portfolio system.

Research data were collected from multiple sources including semi-structured interviews with the students and faculty members (both instructors and administrators); student electronic portfolios: course, program and departmental documentation; observations; and participant feedback. Process tracing through lateral and vertical iteration (Steinberg, 2004) were applied to analyze the data.

Significance of the Study

Tensions associated with the multiple portfolio purposes have been related to the current state of a market economy (Klenowski, 2003), which favors numeric indicators as expressions of student success in a highly regulated system of higher education. The existence of national, state, and institutional standards results “in an over-regulated system that creates a context that is not conducive to innovative processes and developmental approaches to assessment [and learning (L.H.)], as embodied in the portfolio” (Klenowski, p. 7).
State budgets for higher educational establishments have been reported to have decreased dramatically in the face of other priorities (Brownstein, 2000; Gumport & Sporn, 1999; Wilms & Zell, 2002). Reduced public subsidies have been compensated for by tuition increases and the growing involvement of the private sector, marking the beginning of the commercialization era on university campuses (Bok, 2003). Higher educational institutions, ushered into the competitive market, have exercised greater independence from state influence and gravitated towards privatization, decentralization of authority, alternative financial resources, and creative entrepreneurialism and leadership (Levine & Cureton, 1998). Budgetary pressures have insinuated a conflict of interest between educators and politicians, the politicians questioning the implications of academic decentralization and demanding a transparent system of institutional accountability (Kerr, 2001). In such a context of accountability, standards, standardization, and quantifiable outcomes have driven electronic portfolio development, which is used primarily for summative assessment and accountability purposes. Inevitably, the role of electronic portfolios becomes simplified as assessment is introduced for comparability purposes and national requirements are stipulated. . . . For instance, when the task is generalized and reduced to a generic level, it is no longer as demanding. This is because the serious, specific nature of the task is lost. By way of illustration, the intended processes of critical self-evaluation and reflection integral to the development of certain portfolios could give way to unintended outcomes such as using checklists to ensure that the requirements of a standardized structure are met, thereby reducing the assessment [and learning – L.H.] to superficial and trivial purposes. (Klenoswki, 2003, p. 8)

It is of a paramount importance to understand how the multiple purposes of support for learning, program assessment, and accountability interact in ePortfolios and how the use of ePortfolios for multiple purposes can capture individual learning while also serving to address program needs and institutional accountability. This case study was aimed at demonstrating how and when the issues of learning, program assessment, and institutional accountability arose in the practice of ePortfolios in one department as well as how they were addressed.
Working Assumptions

It is useful to begin by clarifying the terms of support for learning, program assessment, and institutional accountability and how they interact in electronic portfolio development.

Support for learning presupposes that students and their learning become the focus of the instruction, intellectual climate, and policy decisions (Cross, 2005). Learning requires that students are involved in “thinking, problem-solving, constructing, transforming, investigating, creating, analyzing, making choices, organizing, deciding, explaining, talking, and communicating, sharing, representing, predicting, interpreting, assessing, reflecting, taking responsibility, exploring, asking, answering, recording, gaining new knowledge, and applying that knowledge to new situations” (Cameron, Tate, Macnaughton, & Politano, 1998, p. 6). Such learning can occur in contexts where the primary purpose of assessment is to support learning (Davies & Le Mahieu, 2003) through holding both students and teachers accountable for learning; involving students in assessment processes in which learners self-assess and receive descriptive feedback about their progress; engaging students in collecting, organizing, and communicating their learning to others; adjusting instruction in response to ongoing assessment information; and creating a safe learning environment to invite risk taking and learning from mistakes (Davies & Le Mahieu, 2003).

For the purposes of this study, institutional accountability is defined as external pressure applied to programs and institutions to assure institutional conformity to the specified forms and measure institutional effectiveness. Program assessment is referred to as a regulatory process of information feedback prompting individual students, faculty members, programs, and schools to revise their actions in order to improve their performance. Frye (1999) explained that, interpreted in this fashion, accountability is a set of initiatives taken by external evaluators to monitor the results of the actions of others (individuals or institutions) and to penalize or reward individuals or institutions based on the demonstrated outcomes, whereas assessment is a set of initiatives taken to internally monitor the results of actions and improve effectiveness.
In this study, accountability is associated with the accreditating and licensing processes. Assessment is used in reference to course and program evaluation. It has been ascertained that institutions are driven by assessment and accountability, which are designed to provide internal and external feedback corresponding to how individual courses, programs, and universities are accomplishing their stated goals (Frye, 1999), and, in assessing their effectiveness, become focused on institutional assets and curricular structures (Gentemann, 1994). Furthermore, external bodies, in measuring the institutional effectiveness, apply arbitrary scales whose meanings are ambiguous and direct institutional goals (Frye, 1999). This results in a tension whereby student learning becomes an institutional outcome to measure institutional performance, not changes in students themselves as a result of their learning experiences.

The tension between support for learning, program assessment, and institutional accountability is then rooted in their purposes (see Figure 1.1). Table 1.1 has been adapted from Barrett (2004b), who compared the practice of ePortfolios to support assessment of learning with the practice of electronic portfolios to support assessment for learning. Barrett

![Figure 1.1. The tension between the multiple purposes of support for learning, program assessment and institutional accountability.](image-url)
Table 1.1. Comparison of the Perspectives of Support for Learning, Program Assessment, and Institutional Accountability in ePortfolio Development (adapted from Barrett, 2004b)

<table>
<thead>
<tr>
<th>Portfolio aspects</th>
<th>Support for learning</th>
<th>Program assessment</th>
<th>Institutional accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purpose</td>
<td>Agreed upon with learner</td>
<td>Prescribed by the institution, program, or course</td>
<td>Externally defined by the evaluating agency</td>
</tr>
<tr>
<td>Audience</td>
<td>Controlled by learner: instructors, peers, administrators, employers, collaborators</td>
<td>Program administrators, course instructors</td>
<td>External evaluators</td>
</tr>
<tr>
<td>Structure</td>
<td>Organization determined by learner and negotiated with instructor/mentor/adviser</td>
<td>Organized around standards, learning outcomes and institutional/program/course goals</td>
<td>Organized around standards, and learning outcomes</td>
</tr>
<tr>
<td>Artifact selection</td>
<td>Selected by learner</td>
<td>Mandated by the institution, or program</td>
<td>Mandated by the evaluating agency</td>
</tr>
<tr>
<td>Feedback</td>
<td>Formative: what learning is needed in the future? Summative: what has been learned? Instructors, peers, mentors/advisors, collaborators, administrators, employers as evaluators</td>
<td>Summative: what has been learned? Formative: how can learning be enhanced for the bettering of the program, or course? Administrators, instructors as evaluators</td>
<td>Summative: what has been learned? External evaluators</td>
</tr>
<tr>
<td>Time</td>
<td>Ongoing throughout the class, term, and/or program</td>
<td>Ongoing Time-limited—at the end of the program, or course</td>
<td>Time-limited—at the end of the program, or course</td>
</tr>
</tbody>
</table>
(2004b) distinguished between two purposes of assessment, whereby assessment of learning is designed by those not directly involved in daily learning and teaching is performed to check what has been learned to date and is presented in a formal report, incorporating information broken into easily digestible numbers, scores, and grades to compare student learning with either other students or the prescribed standard; assessment for learning is designed to assist teachers and students, is used in conversations about learning and is articulated as detailed, specific, verbal, and descriptive feedback focused on improving student results in comparison with student previous progress. This table has also been informed by Davies and Le Mahieu (2003) and educational literature reviewed in Chapter 2. It describes the portfolio aspects from the perspectives of support for learning, program assessment, and institutional accountability.

**Organization of the Dissertation**

This dissertation is organized into five chapters.

Chapter 1, introduces the research problem, identifies the purpose and research questions, explains the significance of the study, describes the working assumptions, and introduces the working vocabulary.

Chapter 2 presents a critical literature review of theoretical and practical inquiries into the multiple purposes of support for learning, program assessment, and institutional accountability entrenched in the practice of traditional (paper-based) and electronic portfolios.

Chapter 3 focuses on research methodology detailing the context of the study, research participants, and data collection. It also introduces the concept of process tracing and the analytical techniques of lateral and vertical interaction that were applied to elucidate the factors and causal mechanisms that are intricately interwoven into the practice of ePortfolios in this department.

Chapter 4 includes the narration of research findings and consists of three parts. In the first part, the student and faculty/staff research participants are introduced and their stories of engagement with electronic portfolios are told. In the second part, the themes that emerged from the data are organized into two research claims examining (a) student and faculty
differences in conceptualizing the multiple purposes of electronic portfolios and (b) student and faculty differences in understanding electronic portfolio purposes. In the third part, the vertical iteration is described through larger organizational processes shaping electronic portfolio development in the department.

Chapter 5 concludes this work by providing an overview of the case study and its research findings. Next, the researcher describes the research process and uses her personal voice to narrate four factors that shaped this case study. Implications for practice are articulated and followed by recommendations for future research.

Finally, the appendices and references are supplied.

**Working Vocabulary**

For the purposes of this study, the following working vocabulary is used:

*Artifact:* a piece of learner work included in a portfolio.

*Efolio:* a static Web site developed by using appropriate software and accessible from the Web. An eFolio represents a purposeful collection of student work and reflections in a digital format. An efolio can also reside on a disk, CD-ROM, DVD, or similar transportable media not accessible from the Web.

*Electronic portfolio:* uses digital technologies and allows the portfolio owner to store, collect, and organize portfolio contexts in many media types (text, audio, video, graphics). Electronic portfolio is an umbrella term for eFolios and electronic portfolio systems (ePortfolios).

*Electronic portfolio system (ePortfolio):* uses electronic media and services and is a nonstatic Web site. An electronic portfolio represents a substantial archive of learner work in a digital format that contains polished artifacts as well as work in progress. Digital artifacts can be reorganized and presented in different ways permitting portfolio owners to control and extend access to diverse audiences. Portfolio owners possess administrative functions for managing and organizing their artifacts (files) and controlling who can see or collaborate on a specific portfolio piece.
Formative evaluation: an evaluation of student learning performed during the processes of instruction and learning to modify both processes in order to meet learner needs (Davies & Le Mahieu, 2003; Huba & Freed, 2000).

Institutional accountability: an external pressure coming from external reviewing agencies at national and state levels to assure institutional conformity to the prescribed standards and measure institutional effectiveness (Frye, 1999).

Metacognition: an internal monologue with a critical stance towards examining one’s own learning in order to self-assess and regulate one’s thinking and actions (Norton-Meier, 2003).

Program assessment: an internal regulatory process of information feedback to prompt programs and departments to revise curriculum and their actions in order to improve their performance (Frye, 1999).

Purposive tension: a conflict created by the purposes of support for learning, program assessment, and institutional accountability in the practice of electronic portfolios.

Reflection: the process of learning from a past experience or event and its impact on further learning.

Reviewing agency: an external body at the national or state level that is not associated with a particular educational establishment and that functions to perform measurements of learner and institutional achievement against prescribed standards.

Standard: a prescribed level of competency against which student academic achievement is measured.

Standards-based portfolio: makes use of a database and/or hypertext links that clearly represent the relationships between standards, artifacts, and reflections, whereby reflections rationalize the presence of specific artifacts in the portfolio, thus evidencing learner attainment of stated standards.

Summative evaluation: an evaluation of student learning produced after instruction has been completed (Huba & Freed, 2000).

Traditional (paper-based) portfolio: a purposeful collection of artifacts demonstrating learner effort, progress, and achievement over time and that contains reflective pieces
indicative of learner cognitive and metacognitive processes on what these artifacts represent, how they were collected and selected, what learning they prompted, and how they might contribute to future learning. A traditional portfolio is placed in a binder and consists of pictures, papers, audio tapes, video tapes, and other artifacts.
CHAPTER 2: LITERATURE REVIEW

This chapter examines the prior research on traditional and electronic portfolios to highlight what is known about the multiple purposes of support of learning, program assessment, and institutional accountability in the portfolio practice. The chapter is structured to describe the literature review methodology, narrate the literature review findings, and discuss their significance.

The review of research literature was critical for identifying the area of investigation for this case study. The literature review describes a range of theoretical and practical research inquiries into the nature of traditional and electronic portfolios in a way that goes beyond a simple summary of existing sources, but rather uncovers research methods and assumptions in order to better perceive whether the claims made by researchers are warranted. Such critical engagement with prior knowledge sets a stage for the subsequent substantive and sophisticated research (Boote & Beile, 2005) on electronic portfolios.

Literature Review Methodology

The literature on electronic portfolios is abundant. For example, the 2005 Society for Information Technology and Teacher Education (SITE) proceedings yielded 203 works on electronic portfolios. A search performed on the Educause (a nonprofit association to advance higher education by promoting intelligent use of information technology) Web site revealed 682 sources. With so much information available from research journals, conference proceedings, books, newspapers, etc., it was important to organize the search strategically and in a fashion pertaining to the purpose of this literature review.

Data Sources

To insure the coverage of relevant literature a decision was made to begin a wide search and collection of publications on traditional and electronic portfolios. The online databases, such as ERIC (Educational Resources Information Center), Dissertation Abstracts (ProQuest Digital Dissertations), Educational Research Abstracts (ERA), and Expanded Academic (ASAP), revealed numerous journal articles and dissertation studies. Each article
and study yielded many references that were thoroughly reviewed and added to the collection. Search engines were used to obtain the portfolio materials. Initially, the keywords “portfolio” and “electronic portfolio” were used for this process. Gradually, as the collection grew in volume, and the author’s understanding became more sophisticated, the two keywords were used in combinations with such terms as “issue,” “learning,” “assessment,” “accountability,” “implementation,” “sustainability,” and “system.” Weblogging resources (such as Helen Barrett’s e-portfolios for Learning Blog, 2007) and online forums (such as the Instructional Technology Forum sponsored by the Department of Instructional Technology at the University of Georgia, 2007) were repeatedly visited to keep abreast of the latest electronic portfolio news. A plethora of literature sources, including refereed journals, seminal books, conference proceedings, reports, unpublished papers, unpublished dissertations, and presentations were entered into FileMaker Pro, a database software, in an effort to manage and organize the portfolio collection.

As the literature search continued, a more analytical approach towards collecting and processing the portfolio resources was applied. To exclude the irrelevant materials a less comprehensive view on traditional and electronic portfolios was taken, as it was deemed appropriate to exclude such forms of scholarship as program descriptions, commentaries, opinion pieces, anecdotal records, and narratives.

Refereed articles from such journals as Review of Educational Research, Journal of Technology Education, Journal of Research on Technology in Education, Journal of Technology and Teacher Education, Teacher Education Quarterly, and Teaching and Teacher Education were considered relevant. Seminal books on portfolios, keynote addresses, conference proceedings, and reports (such as the 2005 report of the American Educational Research Association) were found pertaining to this investigation.

It is important to acknowledge that narrations of both traditional and electronic portfolios were included in this literature review. The literature representing experiences with traditional portfolios was taken into account with regard to a longer history and richer body of research on such portfolios (Elbow & Belanoff, 1997; Michelson & Mandell, 2004).
Evaluative Framework

As the narrowing of literature sources occurred, the conscious re-reading of the collected materials became a routine exercise during which the author attempted to go beyond the passive receiving of the “imprint” of the text, but engaged in “a dynamic process of recreation” (Iser, 1978) that allows for the formulation and interpretation of the thoughts and perspectives encountered in texts and questioning of such thoughts and perspectives. To interact with texts closely, and to represent a systematic effort in analyzing and synthesizing previous studies on electronic portfolios, the evaluative framework incorporating the criteria of context, methodology, and topic was devised. Each study was examined with regard to the context within which it was set up and the guiding research questions, methodology, and research findings (see Appendix A). The context of reviewed sources was limited to higher education teacher preparation and development, and faculty development.

Initially, the methodology criterion was borrowed from Lee, Driscoll, and Nelson (2004). As the evaluative framework evolved, a descriptive study format was added. The following methodologies constituted a new classification system (see Appendix A):

1. **Theoretical inquiry (T):** a theoretical review of literature or conceptual study for proposing new ideas in electronic portfolios.
2. **Experimental research (ER):** a study examining the effect of independent variable(s) on dependent variable(s).
3. **Case study (CS):** a study aimed at qualitatively investigating a single individual, group, program, or organization.
4. **Evaluation research (E):** a study aimed at determining the impact of a project, program, model, or software.
5. **Developmental research (D):** a study aimed at designing, developing, and evaluating an existing or newly developed model/process of portfolio use.
6. **Survey research (S):** a study addressing the distribution and return of responses in a nonexperimental situation.
7. **Descriptive study (Des):** a factually grounded study describing the portfolio practice.
8. **Combination of inquiries (C):** a study synthesizing two or more methodologies.

Within the framework of this methodology, the portfolio literature yielded useful information on the most commonly deployed research inquiries in electronic portfolio development.
The topic classification was constructed to manage a variety of themes that emerged from the literature. Five broad topics were identified: (a) pedagogical and theoretical assumptions on the value of portfolios, (b) portfolio uses, (c) implementation, (d) sustainability, and (e) technical maturity.

The pedagogical and theoretical assumptions topic encompassed accounts about the learning and teaching philosophies, theoretical frameworks, history, and complexity of issues surrounding the portfolio practice.

Portfolio uses included descriptions of individual and institutional uses of portfolio. Individual uses revolved around collecting and organizing evidence of individual learning; performing cognition and metacognition on collected evidence and claimed progress; multiple uses of work; showcasing attainment of learning goals and outcomes to the intended audience; demonstrating validation and feedback from peers, faculty, and the extended community; and collaborating and connecting with others. Institutional uses of electronic portfolios involved data aggregation and disaggregation in order to evaluate the quality of educational services delivered by an institution (for example, course and program evaluations), visibility of the process of institutional accountability, and reflection on institutional learning and improvement.

The implementation topic included stories of complexity and scope of effort, impetus for portfolio initiation, the degree to which portfolios are integrated into curriculum (electronic portfolios as a component of individual courses, program, or integrated curriculum), faculty support and participation, and a grassroots or top-down approach to electronic portfolio initiation and implementation.

The sustainability topic dealt with the issues of access, the degree to which a habit of portfolio exercise is promoted, designation of time for portfolio construction in the curriculum timeline, technical support, and understanding of portfolio assessment and portfolio re-purposing.

Finally, technical maturity embraced the topics of extensive connections (linkage capabilities) to contextualize electronic portfolios, the capability to support asynchronous and
synchronous communication, collaboration and multiple representation and analysis, and electronic portfolio standards for easy transfer and sharing.

The working assumptions about the nature of support for learning, program assessment, and institutional accountability in electronic portfolio development presented in Chapter 1 guided this critical literature review.

The working assumptions were based on the premise that the multiple purposes of support for learning, program assessment, and accountability create tensions in the way these purposes approach electronic portfolio development. When electronic portfolios are used to support learning, their purposes are agreed upon with the learner; when utilized for program assessment and institutional accountability, portfolio purposes are prescribed by the course instructor, program, institution, and/or evaluating agency. The audience of electronic portfolios for learning is controlled by the learner and comprises peers, collaborators, instructors, employers, administrators, and other groups of people; electronic portfolios for program assessment have program administrators and instructors as the intended audience, whereas portfolios for institutional accountability are targeted at external evaluators. The structure of portfolios for learning is determined by the learner and negotiated with instructors, mentors, and advisors, whereas portfolios for program assessment and institutional accountability revolve around structured standards; learning outcomes; and course, program, institutional goals. Furthermore, the artifacts in portfolios for learning are selected by the learner, but are mandated by the program, institution, and/or evaluating agency in portfolios for program assessment and institutional accountability. The nature of the feedback for learning presents a combination of formative and summative evaluations from peers, collaborators, instructors, mentors, advisors, administrators, and employers. In portfolios for program assessment and institutional accountability the feedback tends to be summative and focused on course and/or program improvement as perceived by instructors, administrators, and external evaluators. Finally, portfolios for learning are compiled and maintained continuously throughout the course, term, and/or program, whereas portfolios for program assessment and institutional accountability tend to be used only at the end of the course and/or program.
These working assumptions derive from Frye’s (1999) conceptualization of assessment and accountability that drive institutions to focus on institutional assets, curricular structures, and external evaluating agencies to apply arbitrary and ambiguous scales for measuring institutional effectiveness. Consequently, student learning is equated with an institutional outcome to measure institutional performance, but actual student learning experiences are ignored (Figure 1.1).

In conclusion, the methodology employed for this literature review rests on, first, the evaluative framework that assesses the context of the literature source, methods, and research findings; and, second, working assumptions about the nature of support for learning, program assessment, and institutional accountability in electronic portfolio development. A table summarizing the key literature is located in Appendix A.

**The Purposive Tension in the Portfolio Practice**

The portfolio practices described in educational literature are driven by the forces of support for learning, assessment, and accountability (Anderson & DeMeule, 1998; Barrett, 2005; Barrett & Wilkerson 2004; Paulson & Paulson, 1996; Snyder et al., 1998; Van Sickle, Bogan, Kamen, Baird, & Butcher, 2005; Wilson, Wright, & Stallworth, 2003). The accountability demands are placed on educational institutions as public pressure for better assessments of what students should know and be able to do as a result of their learning experiences (Barrett, 2004b; Darling-Hammond & Snyder, 1992). Standards-based reforms implemented in many U.S. states (Pecheone, Pigg, Chung, & Souviney, 2005) require that students document the successful attainment of standards by demonstrating achieved competence and providing evidence of learning. Institutions then design their programs and courses in ways consistent with such external pressure. Simultaneously, institutions seek internal ways to obtain feedback information to identify areas where improvements are necessary (Fagin et al., 2004). Accountability and assessment are manifested in the use of electronic portfolios as tools for assessment (Georgi & Crowe, 1998) to make decisions about student progress through the process of student comparison across common tasks (Moss, 1994).
The support of learning presupposes the practice of electronic portfolios as reflective tools (Cambridge, Kahn, Tompkins, & Yancey, 2001; Grant, 1994; Herbert, 1992; Snyder et al., 1998; Tancock & Ford, 1996), providing learners with opportunities to take a metacognitive stance towards their learning and professional development. The support function is embedded in electronic portfolios when they are used to collect, organize, and reflect upon artifacts representative of individual thinking patterns and demonstrative of how portfolio owners construct their own sophisticated knowledge, skills, and dispositions versus the mere reiteration of ideas and experiences of others. The evaluation of such portfolios demands the substitution of comparative consistency with the assessment of learners across the same caliber of context specific information (Darling-Hamond et al., 1993).

The purposive tension created by the conflicting perspectives of support for learning, assessment, and accountability is further aggravated by those advocating for the differentiation between learning portfolios that contain work samples in progress representing growth over time and showcase portfolios organized around the highlights of student work (Barrett, 2005; Hauser, 1993). Some authors distinguish formative portfolio purposes (Collins, 1990) that encourage reflection and professional growth from summative purposes that include uses for assessment and evaluation for employment, retention, and promotion (Green & Smyser, 1995). Van Sickle et al. (2005) pointed out that such an abundance of portfolio definitions and purposes creates confusion as to what student work can be considered for inclusion. Similarly, the results of a survey conducted among 24 teacher education programs (Anderson & DeMeulle, 1998) indicated that misunderstanding of the portfolio’s purpose, logistics, and value was reported as one of the most common portfolio tensions.

Electronic portfolios, which Challis (2005) described as a recent addition to the language of higher education, have given rise to numerous definitions in an attempt to clarify the meaning of the phenomenon. The term “electronic portfolio” has been used interchangeably and haphazardly with such terms as “eFolio,” “Webfolio,” Weblogging, and

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3 For instance, Cole and Ryan (1996) separate direct observation, field notes, case studies, logs, and reaction papers from portfolio materials.
wikis (Challis), prompting new calls for clear definitions (Fitch, 2004). The absence of a common definition of electronic portfolios intensifies the purposive tension.

This work views “electronic portfolio” as an umbrella-term for portfolios that use digital technologies, unlike traditional paper-based portfolios, and includes both eFolios and ePortfolios, also known as electronic portfolio systems (see “Working Vocabulary” in Chapter 1).

This literature review describes the practices of traditional (paper-based) and electronic portfolios as assessment and reflective tools and the purposive tension that perpetuates portfolio development. The review then moves on to the discussion of electronic portfolio systems (ePortfolios) and their promise to reconcile the multiple purposes of support for learning, assessment, and accountability.

**Portfolios as Assessment Tools**

The purposes of support for learning, assessment, and accountability in shaping electronic portfolio development bring conflicting pedagogical and theoretical assumptions to the concept of portfolios. When portfolios are used to infer what and how much learning has occurred, they articulate the assumption that the same information can be collected from students to make fair and objective judgments about their learning. Used primarily for high-stake assessments, portfolios then function as testing devices and should meet the psychometric standards of validity, reliability, fairness, and absence of bias (Wilkerson & Lang, 2003) for accountability purposes.

**Portfolios as Assessment Tools for Accountability Purposes**

Rooted in the original perception of a portfolio as a portable case to carry (port) large collections of materials (folio: originally, loose papers and prints; Lyons, 1998; Olson, 1991), the concept of portfolios as mere holders of student work emphasizes archiving documents, such as pictures, papers, audiotapes, videotapes, etc., with the purpose of demonstrating and inspecting student skills and knowledge in the professional field. Such conception values portfolios as receptacles of student work samples (Paulson & Paulson, 1996) and as products (Elbow & Belanoff, 1991) and exploits their physical attributes as containers that hold
tangible evidence of student learning in a way suitable for summative assessment. The emphasis on physical attributes implies that portfolio constructions revolve around artifacts that reflect student ability to regurgitate learned contexts in test-like situations to demonstrate student performance as aligned with externally defined standards (Paulson & Paulson; Snyder et al., 1998). Therefore such an approach assumes the existence of constant meanings across uses, contexts, and purposes and promotes a limited and focused use of portfolios to measure specific skills and knowledge negotiated as competent by external evaluators.

The electronic aspect of portfolios is seen as facilitating the process of collection and demonstration. Young (2002) defined an electronic portfolio as “an extensive resume that links to an online repository of . . . anything . . . that demonstrates the student’s accomplishments and activities” (¶ 2). When interpreted as an extensive resume/curriculum vitae, electronic portfolios are perceived as the repositories of student activities and accomplishments, to be organized, showcased, and distributed to interested parties. Love, McKean and Gathrcoal (2004) believe that such portfolios (identified as a scrapbook and curriculum vitae) are marked by a lack of schema guiding the organization of electronic portfolios and selection of artifacts and are depicted as simple collections of selected assignments to help portfolio owners remember where they have been and what they have done. Such portfolios reside on a disk, CD-ROM, or a similar transportable media not accessible from the Web. If placed on the Web, portfolios receive asynchronous e-mail feedback from course instructors. Students can display deep reflections on portfolio items, but because of the lack of formative feedback from instructors, peers, and other parties, such reflection is not encouraged. Other characteristics of scrapbook and/or curriculum vitae portfolios include: immature student decisions, little or no reflection, linear organization of portfolio items, dominance of the educational authority who determines the portfolio structure, organization and student conformity to the external demands (Love et al., 2004), and the inclusion of polished artifacts that portray one’s work in the best light (Snyder et al., 1998).

Portfolios as assessment tools used for accountability purposes are used as aggregate and disaggregate data (Anderson & DeMeulle, 1998; Strudler & Wetzel, 2005) to
demonstrate that students are able to generate work samples addressing external standards. Students’ graduation from the institution or program is seen as a successful student output computed without regard to the incoming student differences or individual progression (Frye, 1999).

**Portfolios for Course and Program Assessment**

Portfolios used for the purposes of conducting course and/or program assessment can potentially promote a shift from monitoring student learning to enhancing and diagnosing learning (Huba & Freed, 2000). Program improvement as a regulatory information feedback process can be realized through the gathering and discussing of information from multiple and diverse perspectives to help faculty and administrators deeply comprehend what students know, understand, and do with their knowledge as a result of their learning experiences (Hackman & Alsbury, 2005). Portfolios, if used to gather and analyze such information, offer multiple authentic assessment materials representative of a detailed mosaic of student learning evolving over time (Black, 1993). These can help courses and programs identify areas for improvement and enhance instruction and student learning experiences.

Interpreted in this way, course and/or program assessment is at odds with accountability purposes, given that “accountability aims at improving fiscal efficiency, but is blind to issues of educational quality. Assessment aims at improving the quality of education, but is necessarily constrained by budgets” (Frye, 1999, p. 3). Institutions are aware of the necessity to both aggregate statistics on student outcomes in order to measure institutional performance and conform to the external pressure and standards, and to deploy feedback information to re-evaluate and re-adjust educational course and programs (Frye, 1999). The process of redesigning courses and/or programs, however, tends to focus on departmental assets and structures instead of moving towards the analysis of actual student learning experiences in the course and/or program, the evaluation of the ways in which resources are used, and the consequences of such uses (Gentemann, 1994). Thus the practice of portfolios as assessment tools for program and/or course evaluation is institution-centered (Barrett, 2004b).
Love et al. (2004) pointed out this fact in their description of electronic portfolios for curriculum collaboration between students and faculty. The authors acknowledged the value of such portfolios for linking formative and summative feedback to the specific multimedia student work samples. However, because the context structure is provided by the institution that supplies program information, course syllabi, assignments, and resources, student roles are then limited to responding to assignments and contributing to the context structures of their portfolios within the departmental and program curricular framework or institutional showcase of student achievement as a matter of meeting program demands (Love et al., 2004). Portfolios then function as assessment tools to evaluate student outcomes in lieu of authoritative evidence to report the effectiveness of institutional performance. Several practical research inquiries were located describing the practice of traditional and electronic portfolios as assessment tools and the tension between the purposes of accountability and assessment.

**Empirical Research on Portfolios as Assessment Tools**

In one study, Placier et al. (2001) reported that, due to policy changes towards state political control and practicality, portfolio purposes were transformed from individualistic, developmental, and constructivist to summative for credentialing and accreditation. In this study, a teacher education program was being redesigned to address the preservice teacher professional development through the delivery of meaningful, reflective, and inquiring learning experiences to bring diversity, multiple perspectives, reflection, and developmental principles to the attention of the prospective teachers. The program document was created to emphasize cognitive development and contextualized learning and encouraged unique representations of student knowledge constructed as a sum of their individual reflection, personal background, campus activities, and field engagements. The program evolved from the traditional portfolio practice to electronic portfolios.

The described intentions, however, were transformed twice. First, the state (in cooperation with NCATE), concerned with teacher certification and teacher education program approval, made a decision to use the final portfolios of the prospective teachers to judge the quality and effectiveness of the teacher education program. Second, to conform
with the policy of demonstrating preservice teacher proficiency with technology implementation (based on national ISTE standards), the teacher education program introduced electronic portfolio templates that constrained student creativity. Thus the portfolio purposes and intentions became focused on state requirements and summative judgments about candidates who were forced to follow an easy template that limited their choice and creativity (Placier et al., 2001). The study reported that the participating faculty did not understand the importance of electronic portfolios as it was initially stated in the program document. Instead, they viewed portfolios as a vehicle to demonstrate their students’ compliance with the state and national standards.

The participating students created two portfolios: one to pass from the first level of the program to the second, organizing the portfolio around the required standards; the other, called the “interview portfolio,” meant to be used during the pre-student teaching interview with a school principal and to encourage individual expression, choice of artifacts, and individualized thinking patterns. The students reported that the portfolios were produced to “get them done” and were not representative of who students were, and they indicated that the portfolios exhibited a level of appropriation of student learning in a very summative way. One student explained that he felt that his portfolio became a way of spitting out the course content. The interview portfolios turned out to be a mundane exercise to pass the course requirements. One student reported,

I learnt a lot about myself as far as education. My philosophy of what I think of a teacher, and how I’m gonna be a teacher, yeah, I learnt a lot of stuff. But, then, again, a lot of it was just thrown on paper just to get it done, get it turned in, you know?

The students experienced stress because the changes in program were confusing and contributed to the lack of clarity about the portfolio purpose and construction process, and there was an absence of ongoing, formative feedback from the instructors. The faculty did not receive adequate technical preparation and felt that students had spent too much time on the technical aspects of the portfolio.

Although the study presented very thought-provoking findings, its methodology contained insufficient details as to how the study was designed and managed. The researchers claimed that 9 individual students had participated in the study, however, no criteria
describing the intended or randomized choice of the participants was acknowledged. In relating the faculty perspectives, the researchers did not specify either the number of the participating faculty or the criteria that helped to identify the faculty population.

The data emerged from 10 student interviews, fieldnotes from classroom, and school observations, interviews with administrators and faculty, reports, syllabi, assignments, and portfolios. Ten interviews were confirmed to be conducted with 9 participants, however, no indications were made of how the interviews were structured. Given that the prospective teachers were very sincere about their feelings in the interviews but preferred not to reveal them in their portfolios, it would be important to clarify why there were 10 interviews conducted with 9 participants and how the interviews were conducted to ensure such openness. One explanation could be found in the text: The researchers disclosed that they were not part of the teacher education program. This fact was treated as an advantage to the study in helping to gain access to information not readily disclosed to insiders. On the other hand, meaningful bits of information could have escaped the attention of the researchers precisely because they were not familiar with the workings of this particular teacher education program.

In a different study narrating the practice of traditional portfolios, Breault (2004) voiced his concern about being both the principal investigator and a faculty member familiar with several participating student teachers who accepted the invitation to become part of the study. Breault assumed that student honesty and openness might have been hampered by his faculty status. His findings echoed the previous study: The most prominent portfolio dissonance was associated with the lack of the stated portfolio purpose.

In Breault’s (2004) study, 10 student teachers constructed traditional portfolios to showcase their ability to use the principles of effective teaching as formulated by the Interstate New Teacher Assessment and Support Consortium (INTASC). The student sample for the study was not random but constituted a balance of male and female volunteers and elementary and secondary majors who had a variety of predicted skills (as identified from the previous field experiences and course work) and the ability to articulate their thinking (as identified by the faculty familiar with the student participants). The last two criteria could be
critiqued as succumbing to faculty subjective judgment, and the researcher recognized this challenge.

The required portfolio was intended to provide a comprehensive, authentic, and situated picture of student ability to incorporate the INTASC principles into their student teaching and assist the program evaluation. However, the role of the INTASC principles created much confusion: Accepted as a starting point for student critical reflection and the improvement of instruction, such principles inferred that student teaching is a part of professional development towards a competent teacher; accepted as ways to categorize what students had learned, these principles inferred that portfolio owners either had or did not have sufficient expertise for effective teaching (Breault, 2004, p. 852). The study suggested that, in the face of uncertainty, the student teachers unanimously favored a more limited view of the portfolio as documentation and categorization. All the participants assumed that they were competent teachers and that the INTASC principles would surface when it came time to identify them for the portfolio.

The other tensions of portfolios surfaced in this study as associated with the axiological, perceptual, and conceptual dissonances. The axiological dissonance was depicted as the degree to which the participants could relate to the value of the portfolio process and whether it was worth the time and effort. The perceptual dissonance had to do with how the preservice teachers perceived the portfolio as the fit between the sum of their student teaching experiences and the program requirements. The conceptual dissonance revealed the degree to which the students thought critically about their teaching practice.

With regard to the axiological dissonance, Breault (2004) found that the degrees to which the university faculty and students valued their portfolio was different. The students were aware that their portfolios would be perceived as representative of their teaching and learning and voiced their concerns that portfolios were not able to reflect the whole complex and improvisational nature of the classroom, that the process of documentation and writing might not adequately capture who they were. Student opinions about the value of the portfolio differed within the participating group. Some students admitted the value of consciously documenting and writing their experiences, whereas others recognized that they
had become aware of what was happening in the classroom in the process of portfolio construction.

Because the experiences of the student teachers varied greatly, the perceptual dissonance yielded useful information regarding students concerns about using a portfolio as a high-stakes instrument whose validity and authenticity were questioned. Then again, the participants felt their portfolio was assessed as a product instead of as an educative process, in the course of which they learned from their mistakes.

Finally, the contextual dissonance provided insights into the quality of portfolio reflections. Breault (2004) found that one participant believed that writing down her reflections immediately after a lesson impacted the way she conducted the next lesson. The other participants assumed that the act of reflection was such a natural part of teaching that the portfolio requirement did not prompt their thinking in qualitatively better ways. Overall, Breault concluded that it was not clear if portfolio construction led to a more meaningful way of thinking.

Breault’s (2004) study suggests that tensions exist in the ways the portfolio practice are treated for the purposes of accountability and program assessment, whereby the latter promotes the conceptual framework of prospective teachers being agents of change and in need of systematic thinking of their practice. It was recommended that portfolios are potentially in danger of becoming another test unless they become viewed as “a more formative type of evaluation and serve more as a snapshot of a given moment in the preservice teacher’s progress towards becoming a professional” (Breault, p. 858).

Breault (2004) conducted four semi-structured individual interviews with each participant. The final interview was performed before the participants were notified of their portfolio evaluation in order to avoid the evaluation impacting the participant’s perception of the portfolio. The described interview protocols included three aspects of portfolio decision making, such as the use and nature of outside information sources and support; the interrelations between content decisions, INTASC standards, and course work; and specifications for the content choices. Breault did not report the findings unless the evidence was present in at least half of the interviews; that is, each finding emerged as a summation
from at least 5 participants. Such thoroughness in collecting data is an advantage of the study, however, the sample population was limited to 10 volunteers chosen on the criteria that might have been biased and not representative of all portfolio owners participating in the described program (the criteria were a variety of predicted ability skills and the ability to articulate thinking as identified by the faculty familiar with the student participants).

In a study conducted by Snyder et al. (1998), preservice teacher students in the Teacher Education program at the University of California at Santa Barbara (UCSB) developed a “credential portfolio” to document the successful initial attainment of the standards of teaching codified in state credentialing requirements. This kind of portfolio was constructed around specific licensure standards defining “what ‘good’ teachers need to know and be able to do in order to work effectively with students and their families” (Snyder et al., 1998, p. 46). The 10 outcome standards outlined by the California Commission on Teacher Credentialing were listed in the form of a grid, which had across the top the categories of the sources of evidence and types of artifacts that students could choose to document their meeting of the state-defined standards. The presence of the grid implied that the content of credential portfolios was controlled and assigned by external evaluators, and prospective teachers would only need to “fill in” the columns of the matrix.

Such externally defined categories limited the ability of students to construct their own knowledge, skills, dispositions, and thinking patterns. The UCSB educators believed that, defined in this way, portfolios would not support ongoing growth and professional reflection and made a decision to introduce an “M.Ed.” portfolio to support learning. This portfolio was organized around a set of guidelines representing issues from preservice teachers’ fieldwork. The successful completion of the M.Ed. portfolio was validated through conversations with members of the portfolio owner’s support group and public conversations during which students received feedback on their portfolio from five critics representing school, university, and parental perspectives, as opposed to one external evaluator who assessed their credential portfolios. The research findings of this study suggest that portfolios centered around external standards lacked student control in collecting and selecting artifacts. The credential portfolio’s purpose was perceived by most students as displaying the most
glorious results of learning where mistakes and errors had no place. In their M.Ed. portfolios students were more inclined to talk openly about their mistakes and, what is important, reflect upon them.

Thus Snyder et al.’s (1998) study articulated the existence of the purposive tension described by the two previously described studies (Breault, 2004; Placier et al., 2001). Snyder et al. did not reject the idea of accountability, but believe that delivering high-stakes accountability should be necessarily coupled with the support of learning. This research did not articulate whether preservice teachers’ learning would have yielded the same results if they had had no opportunity to develop an M.Ed. portfolio. Also, no notice was made indicating whether their teaching practices were actually influenced by portfolio construction.

Hackman and Alsbury (2005) described the use of traditional portfolios to enhance the Administrator Preparation program improvement at ISU. The researchers assumed that thorough analysis of summative student portfolios could enable the faculty to draw conclusions as to the effectiveness of the program to prepare aspiring school leaders and engage in a programmic reform.

Hackman and Alsbury’s (2005) study employed mixed, qualitative and quantitative, methodology to analyze 26 portfolios of recent principal licensure graduates (9 females and 17 males) developed to assess student proficiencies within the Interstate School Leaders Licensure Consortium (ISLLC) standards. A deductive qualitative analysis was used examine portfolio contents. The researchers developed a scoring scale to convert the portfolio quality aspects of organization, critical, and reflective thinking; grammar, spelling, and mechanics; overall presentation; and use of references into a numerical rating to measure student overall attainment of the ISLLC standards as well as each of the quality aspects mentioned. The resulting instrument consisted of four descriptors, each of which was assigned a number of points: advanced (4 points), basic (3 points), emerging (2 points) and unacceptable (1 point). The portfolios were then scored independently by each of the two researchers who utilized several methods, including inter-rater reliability and a content analysis protocol. The content analysis protocol incorporated the ISLLC standards delineated into 44 knowledge, 44 disposition, and 97 performance descriptors against which 6 portfolio reflections (one for
each standard), the overall portfolio reflection on the progress of student learning in the entire program, and 12 artifacts (2 for each standard) were marked. Upon agreement, leading to modification of the original rubric scale, the quantitative approach was applied to the procured numerical outcomes of content analysis.

The mixed methodology used was beneficial to yielding multidimensional information. The scoring instrument consisting of 186 items seems very complicated, but such complexity displays an unusually thorough attitude towards portfolio evaluation. The qualitative aspect of the study might have benefited from including student voices describing their perceptions of the portfolio practice to verify the researchers’ assumptions about gender differences, academic freedom, and individuality.

Hackman and Alsbery’s (2005) findings indicate that most portfolio artifacts were produced as class assignments, resulting in lower quality reflections that did not incorporate the use of literature references, thus making an ambiguous connection between theoretical knowledge and administrative practices. A consistently higher female versus male performance on portfolios was established as the females scored higher on every standard. Most importantly for this literature review, the study uncovered two aspects of the portfolio practice with regard to program assessment. First, the faculty did not provide students with a clear definition of the purpose of a portfolio meant for program assessment and a portfolio meant for self-assessment. Second, the students, forced to organize their artifacts around the required standards, tended to compartmentalize their learning activities into the six standards. These two facts eloquently demonstrate the existence of the tension between accountability and assessment. The students presented their showcase portfolios being aware of the program assessment purpose. The faculty, however, had intended that these portfolios contain the materials exhibiting student learning in progress.

Hackman and Alsbery’s (2005) conclusion called for the provision of more structure in the explanation of portfolios as a measure to ensure students submit artifacts that were error-free; thus it was ascertained that the limitation of student freedom to choose artifacts was necessary. It was stated that the faculty had sought portfolios that might help the program identify areas needing improvement but polished, high-quality, and error-free artifacts were
required for inclusion. Together with the fact that student knowledge was found to be compartmentalized, the program purpose did not appear to address the areas requiring improvement, but conformed to the external pressure applied by the ISLLC standards.

In another study (Carney, 2001), six teacher candidates majoring in three different secondary subject areas—language arts, social studies, and science (physics)—developed traditional and html-driven portfolios (eFolios) residing on a CD or the Web in lieu of a traditional thesis for the Master in Teaching degree after the completion of student teaching. The purposes of such portfolios were defined as evaluation tools to determine the candidate’s grasp of the 15 learning goals and targets identified by the program as well as reflective tools to deepen portfolio authors’ thinking about their emerging teaching practice. The participating students were aware of the twofold nature of their portfolios to showcase the attainment of the program requirements and to demonstrate learning in progress. The study found that eFolios offered greater potential in facilitating preservice teachers’ conceptualization of themselves and the representation and communicating of their knowledge to others. However, both the authors of traditional and eFolios struggled with the multiple portfolio purposes; specifically, all of the participants chose to withdraw particular items that might have been problematic for the high-stake assessment and avoided the inclusion of an honest discussion of issues they encountered during their student teaching (Barrett & Carney, 2005; Carney, 2001). Instead, the polished portfolio versions, which were associated with lower student satisfaction and inadequate sense of ownership, were handed in.

Carney (2001) collected data through participant observation, think-aloud commentaries, and participant interviews. A portfolio content analysis was performed alongside an examination of the teacher education program requirements and portfolio evaluative rubrics. Two comments regarding the think-aloud methodology can be made. First, the think-aloud strategy can become a unique source of information, but it requires certain adjustments from the participants, who are used to internal thinking, to express verbally what they are experiencing at the moment; inevitably, the complexity of thinking is lost. Second, this methodology requires a well-trained observer who is able to interpret the words of the
participants correctly (van Someren, Barnard, & Sandberg, 1994). Carney (2001) did not specify the think-aloud protocols and coding processes, which makes it difficult to determine the thoroughness of this methodology.

Wilson et al. (2003) studied 111 preservice students who constructed html-driven eFolios throughout their enrollment in the “secondary methods block,” which consisted of four courses (content methods, content area literacy, clinical experiences, and test and measurement). This study lacked a detailed description of many aspects of portfolio development, which is necessary in order to deeply comprehend and make a judgment about the presented findings. Specifically, the eFolio media (disk, CD, Web) were not defined, and the portfolio purposes were unclear. The research questions were formulated to gain insight into the preservice teachers’ perceptions of eFolios in teaching and learning and compare the preservice teachers’ perception of electronic portfolios at the beginning and the end of the methods block.

Important for this literature review was the finding identifying confusion among the participating students as to the purposes of the portfolio. While collecting and organizing their best work samples, the preservice teachers displayed little reflection and critique of their developing pedagogical skills and experiences. In bringing the disconnect between the student reflective processes and the developed product to the forefront, Wilson et al. (2003) considered the possibility of using different portfolios for different purposes; for instance, a learning portfolio to demonstrate progress and a showcase portfolio for credentialing.

In another study (Piper, 1999), 12 multiple-subjects credential students in a small Northern California university teacher preparation program who were enrolled in reading methods classes created eFolios to demonstrate mastery of the course objectives based on the state teacher certification standards. The eFolio templates were designed for students to organize and present evidence in the form of personal reflections, course assignments, pictures, photographs, and audio and video recordings in ways that demonstrated the course attainment. eFolios within the framework of this study were perceived as effective tools for documenting teacher candidate performance and the attainment of course objectives.
Unlike the rest of the studies, Piper’s (1999) research did not indicate tension between the purposes of accountability and assessment. On the contrary, the teacher certification standard embedded in the course was presented as facilitating the process of student reflection and self-evaluation. Piper characterized eFolios as evolving during the course of this research due to revisions in the state credential standards. Because the course objectives were linked directly to the certification process, the course was redesigned to incorporate the revised standards. Piper, stating that her research was focused primarily on uncovering the potential of eFolios to enhance reflection and self-evaluation, did not describe how such revisions of the standards had impacted student understanding of the purposes of electronic portfolio development. Instead, many pages of this dissertation are dedicated to the electronic portfolio template design and redesign and the technical difficulties experienced by the students in the process.

Piper’s (1999) research is instrumental in understanding the premise of accountability in the context of higher education, where technology serves as a medium for the creation of eFolios to infer what and how much learning has occurred as far as the attainment of course objectives is concerned. The students were involved in the creation of eFolios to satisfy outside interested parties with the artifacts and reflections organized around standards.

**Summary: Portfolios as Assessment Tools**

To recapitulate, the strength of portfolios as assessment tools is commonly perceived as the ability to make judgments about student growth by comparing student performance across tasks. Such an approach reflects the pressure of the standards-based movement to insure that institutions document students’ successful attainment of standards. Portfolios as assessment tools tend to be highly structured and marked by the dominance of an educational authority that controls what and how student work samples are generated, collected, and demonstrated. Consequently, student roles are limited to responding to assigned tasks and covering the context structures of their portfolios within provided departmental and program curricular frameworks. The electronic aspect of such portfolios is circumscribed to storing and displaying extensive collections of student artifacts.
The practice of electronic portfolios as assessment tools is entangled in the web of tensions created by the conflicting purposes of assessment and accountability. The regulatory function of course and program assessment implies that student portfolios present opportunities for multiple authentic assessment and expose valuable information telling a story of student learning over time that can potentially help with identifying areas for course and/or program improvement and enhancing instruction and learning experiences. However, institutions succumb to external pressure placed by accountability and use portfolios for aggregating and disaggregating statistics to measure institutional performance and demonstrate alignments with prescribed standards.

The several studies described so far revealed great tension between assessment and accountability in portfolio development. Most of these studies employed qualitative methodology, and one study (Hackman & Alsbury, 2005) used mixed, qualitative and quantitative, methodology. Next, this work moves on to examine the practice of traditional and electronic portfolios as reflective tools and review tensions that arise when the purposes of accountability and assessment clash with the reflective and learning orientation of electronic portfolios.

**Portfolios as Reflective Tools**

Perceived as reflective tools, portfolios are viewed as vehicles for fostering authentic learning and metacognitive processes aimed at taking a critical stance towards one’s learning and setting of further goals (Anderson & DeMeulle; 1998; Paulson, Paulson, & Meyer, 1991; Vavrus, & Collins, 1991; Wade & Yarbrough, 1996). Such portfolios represent student progress over time and prompt open and honest reflections on the struggles and failures that are inevitably tied to the process of learning.

Schulman (1998) associated portfolio construction with engagement in a theoretical activity, implying that portfolio design and development represent a form of thought and judgment or a formulation of a person’s theoretical orientation to learning that is most valuable to that person. Defining teaching portfolios, Schulman (1998) argued, “theory of teaching will determine a reasonable portfolio entry. What is declared worth documenting, worth reflecting on, what is deemed to be portfolio worthy, is a theoretical act” (p. 24).
Schulman envisioned concrete situations and their intricate complexities to be at the very heart of the theoretical act, and when carefully written as cases of a student’s own teaching and organized into a teaching portfolio, they become “a supreme act of reflection, an attempt to capture an extended piece of one’s own teaching [and learning], which is then transformed narratively, so that it can be examined, looked at, and thought about” (p. 24).

Portfolios are then opportunities for learners to display, think about, and engage in an unfolding and ever-evolving intellectual work in the course of which their understanding of teaching and learning become transparent. Such portfolios are marked by collaboration, reflection, and discussion that offer a sense of ownership and responsibility of which learners are acutely aware when selecting, organizing, and operating with the materials representing their teaching and learning philosophies. Schulman (1998) thus believes that portfolios are “the structured, documentary history of a set of coached or mentored acts of teaching . . . fully realized only through reflective writing, deliberation, and conversation” (p. 37).
Teaching portfolios are, in Schulman’s (1998) words, ideological acts professing learner understanding, values, skepticism, and doubts as integral to their identity and evolving through collaboration and community membership.

Electronic portfolios as reflective tools value an ultimately intimate process of portfolio compilation, in the sense that it calls for the construction of knowledge and understanding in a way that requires learners to consider the uniqueness of their experiences, “experience[s] that combines reflection and technology and is linked to how (one) knows learning occurs” (Norton-Meier, 2003, p. 518) Norton-Meier coined the concept of “efoliating,” that is “peel[ing] back the layers of learning in an electronic or technological format (wherein the creator sees unique connections through the process)” (p. 521). The idea of efoliating implies the rethinking of writing and reflection and exempts learners from a predetermined manner of composing a reflection and compiling supporting documents. Instead, electronic portfolios allow for the creation of learners’ “own sense of interconnectedness of those artifacts (work samples) while arriving at much richer understanding of themselves and the standards against which they are being measured”
The interpretation of electronic portfolios in such a way recognizes learners as developing beings whose knowledge and understanding are constantly evolving. The process of efoliation places learners in the kind of situations in which they revisit and revise what they do in the process of constructing themselves as learners (Cambridge & Cambridge, 2003) through the incorporation, manipulation, and interconnectedness of student artifacts woven together by the power of technology and learner creativity. By an act of constructive reflection there emerges a “cumulative, multi-served, and multi-voiced identity” (Yancey, 1998, p. 14) that is revealed through an organized electronic portfolio format. Efoliation makes the process of “articulating the relationship between and among the multiple variables of creation, the creator, and the context for the creation” (Yancey, p. 14) visible as learners cogitate on their own learning in relation to identified goals and competences thus telling their own learning stories.

Several examples of practical research on electronic portfolios as reflective tools have been located.

**Empirical Research on Portfolios as Reflective Tools**

Darling (2001) conducted a study in which 31 students who had completed two semesters of coursework were expected to develop their portfolios before their extended practica as inservice teachers began. This research viewed the construction of traditional portfolios as narratives of emerging teachers, as learning progress resulting from student learning experiences in the program. In their portfolios “students would need to illustrate ways in which they grappled with, for example, theories of learning, the development of literacy, classroom climate, and issues related to the social and political contexts of schooling” (Darling, p. 111). Four components were required to be included among student choices of artifacts: an introduction explaining the selections and reasoning behind them; a philosophy of teaching, an example of teaching practice related to the subject areas; and an action plan for teaching providing rationale for classroom organization and governance, curriculum goals, instructional approaches, and plans for professional development. The criteria for portfolio evaluation, including the portfolio coherence, comprehensiveness, clarity, creativity, and communicative potential, was discussed by the instructional team and
the students, in the course of which both parties eventually rejected the pass-fail option as being unsatisfactory.

Darling (2001) described the process of compiling portfolios as disorganized and uncertain, when at the start of the program the students were not clear about the purpose of their portfolios and what artifacts it should encompass. As they collected, modified the portfolio items, and communicated with their instructors and peers, the portfolio themes began emerging, even though they were not always clear to the portfolio writers. Instructor and peer feedback, as well as several afternoon sessions dedicated to portfolio sharing, were instrumental in helping the students make sense of their experiences. Multiple submissions of portfolio drafts, work in groups, and group reporting on the portfolio progress were built into the timetable and encouraged. Upon completion, the portfolio products were shared with the instructional team and peers and the portfolios were assessed by the instructional team as a collaborative effort.

Even though several students did not progress beyond the understanding of electronic portfolios as random collections of artifacts, others felt that the portfolio practice, involving the exposure to the guidelines of the portfolio process, peer editing, multiple revisions, negotiation of evaluation criteria, and conversations with the design team and peers, opened up opportunities for those who were inclined to dialogue about issues. Darling (2001) noticed that student involvement resulted in “the knowledge that they had dealt seriously with perennial dilemmas and conflicts in education” (p. 119). Thus, out of 12 participants, 8 intended to seriously deliberate on the literature and perform conceptual explorations of their motives, beliefs, and principles and reported to have benefited from the portfolio activities. A commitment to deliberate seriously was “undertaken in the spirit of genuine engagement with those people who can shed light on the unfolding narrative— instructors and peers, researchers and other writers, and school-based educators” (Darling, p. 111). Four students never moved beyond the understanding of portfolios as “another hoop to jump through” (p. 118). Darling made the assumption that portfolios can help nourish the passion for ongoing discovery and learning but cannot instill it in those students who are not willing to meaningfully engage in portfolio activities.
Darling (2001) video-taped 12 sessions with those participating students who volunteered to speak about their experiences with the purpose of furthering the research on the value of portfolios and giving advice to the upcoming cohort of teacher education program students on the process of portfolio development. Having no audience sitting in front of them during the sessions, the students could speak for up to 10 minutes, occasionally interrupted by the researcher for minor clarifications. Apart from the information on how the interviews were set up, no other explanation of the methodology was given. The author did not specify what techniques were used to analyze the data, whether and how the content analysis was performed, or whether it was based solely on the interviews or included an examination of the portfolio products; the absence of these points contributes to the weakness of this research.

Avraamidou and Zembal-Saul (2003) conducted a study describing the engagement of two prospective teachers with WebFolios and reported that electronic portfolios provide a place for connecting coursework and field experiences, transforming from a descriptive to an explanatory mode, engaging in reflective and metacognitive activities, and focusing on teaching science as an inquiry. The ability of WebFolios to keep multiple versions of the students’ teaching philosophies and offer hyperlinking for the nonlinear, dynamic representations of such philosophies and the public nature of Web publishing motivated portfolio authors to reflect and critically examine their own beliefs and ideas about teaching and learning in ways consistent with the concept of active learners, who engage, grapple, and seek to make sense of things. The students in this study perceived portfolio development as enhancing their sensitivity to children’s thinking and their ability to connect physical engagement of children with conceptual aspects of learning, crystallizing their focus on teaching science as inquiry and realizing what teachers can do to support children’s learning. Avraamidou and Zembal-Saul concluded that

engaging [students] in thoughtful reflection through Web-based portfolio development within an innovative context, appeared to have had an impact on their conceptions about teaching and learning. In particular, a shift in the participants’ understandings about learning and teaching became apparent through the Web-portfolio analysis. (p. 436)
The WebFolios created by the two student participants as a part of an elementary science methods course consisted of a collection of course assignments and a personal, evidence-based philosophy about science teaching and learning to demonstrate their ability to explain the development of personal theories about teaching and learning, promote reflection on personal theories as informed by experiences and learning, and facilitate the development of connections between theory and practice. As the semester evolved, the students were asked to modify their teaching and learning philosophies, keep all the versions in their portfolios, and publicly defend their claims.

This research used pattern-matching, explanation-building, time-series analysis, and content analysis techniques to interpret the data, which consisted of the student portfolios and reflection statements developed by each participant, in which they discussed what changes were made in different versions of their philosophies and why. The combination of the techniques applied to determine the learning patterns within and across student portfolios is an advantage of this study, whose research questions were built around student learning and change over time.

However, the two preservice teachers for this study were identified by the assertion that the participants represented prospective teachers’ understanding of teaching science. No further clarification as to how and what criteria were used to justify the representativeness of the participants were supplied. The provision of such an explanation is an important part of a methodology for the researchers to claim that their findings reflect a representative learning pattern in the cohort of the prospective elementary teachers to which the participants belonged.

McKinney (1998) described the advantages of eFolios in presenting student documentation in a nonlinear nature that was demonstrative of personalized ways of learning. The limited space afforded by eFolios was viewed by the participating students as taking a selective and reflective stance towards the portfolio content. On the other hand, the affordances of eFolios to bring “extra” stuff (sounds, flashy pictures, etc.) to the content encourages fluff that does not add up to the depth of student reflection.
Five students, who were members of the Collaborative Learning Instructional Methods Block (CLIMB), developed eFolios, whereas the rest of the cohort (16 students) chose the traditional format. The CLIMB experimental program envisioned that elementary teacher preparation should recognize teaching as learning, promote inquiry-based learning, develop reflective decision making, develop preservice teacher understanding of the increasingly diverse student population, and help novice teachers establish collaborative dialogues with other professionals. Accordingly, the purpose of student portfolios was stated as demonstrating student growth as learner-teachers in methods coursework and the field practicum. During the two semesters of enrollment in the CLIMB experimental program, the students created two portfolios: one as part of the children’s literature course and a second as a continuation of their first semester work in which they focused on the field aspect, looking closely at the individual children they taught. The portfolio products were shared with supervisors and methods instructors during the portfolio conferences, where students talked about portfolio development.

McKinney (1998) reported that student reflectivity evolved in the process as the students began synthesizing knowledge and became more understanding of the potential portfolio audience. The two outside reviewers and one inside reviewer (McKinney) found the students grew more sensitive of the audience, student thinking shifted towards nonlinearity, and the students displayed a greater willingness to experiment in the second portfolio.

This study incorporated mixed methodology. Data sources included the survey responses collected from the CLIMB cohort, who constructed traditional portfolios; the portfolio products; survey responses; and a transcription of the focus interview from the five participants. The researcher used the survey responses from the CLIMB cohort to underpin the findings that emerged from the five participating students. A combination of methods as a way to triangulate data constitute a strong point of this methodology. The research, however, did not address what qualitative and quantitative analyses were applied to interpret the data.

Several studies identified the need to encourage research on the potential of eFolios to prompt meaningful cognition and discussion (Brown, 2002; Carney, 2001). In the research by Wilson et al. (2003) mentioned earlier the students demonstrated reflexivity when preparing
their digitally edited teaching episodes to be included in their portfolios but did not seem to reflect upon the other components of their electronic portfolios. Thus, an apparent disconnect between the reflective process and the developed portfolio products surfaced.

In relation to traditional portfolios, Stone (1998) discovered that students had a confusing and narrow understanding of the portfolio development purpose and had difficulty collecting and selecting artifacts and writing reflections, even though the majority of the 85 participants perceived portfolios as a means to encourage reflection and learning. The inexperienced and unknowledgeable advisors tended to encourage student focus on resumes and such portfolio items that could demonstrate student marketing potential rather than promote reflection.

In Stone’s (1998) study, the perceptions of the value of traditional portfolios were examined by means of comparing the experiences of two groups of students, one of which was a school-based cohort of 25, and the other comprising 60 randomly selected students who were not a part of the cohort group from the regular teacher education program based at the university. The participants from both groups completed a questionnaire at the end of the student teaching semester to evaluate their experiences with portfolios. The second group, whose supervisors of conducted a large group presentation and provided students with detailed instructions on portfolio development but did not offer direct and individual assistance for portfolio constructions like the supervisors of the second group, were also asked to complete questionnaires. Semi-structured interviews with the students and supervisors were conducted. The resulting data were analyzed using quantitative and qualitative methods and triangulated; a description of how the analytical processes were used was not presented.

This research did not clearly formulate how the sample for the first group was selected or what learning experiences were offered by the preservice programs whose students participated in the study. Because of such ambiguity, it is difficult to determine whether the detected differences resulted from different conditions in which portfolio development occurred or from different learning experiences embedded in the two teacher preparation programs.
Supporting the claim that more empirical research is needed to study the impact of electronic portfolios on student responsibility and self-reflection (Carney, 2004), Barrett (2005), a recognized expert on electronic portfolios in education, together with TaskSteam, a provider of an electronic portfolio system, initiated an 18-month study on the impact of electronic portfolios in secondary schools on student learning, motivation, and engagement.

**Empirical Research on Tensions of Using Portfolios as Assessment and Reflective Tools**

The conflicting purposes of accountability and support for learning have been rigorously discussed with regard to the practice of electronic portfolios (Barrett & Carney, 2005). Several studies mentioned in this literature review diagnosed a tension between the perceptions of portfolios as assessment tools and portfolios as reflective tools (Breault, 2004; Carney, 2001; Snyder et al., 1998; Wilson et al., 2003).

Green and Smyser (1995) argued that the evaluative portfolio function overshadowed the reflexivity of portfolio practice. The formative purposes indicating the progress of learning, the presence of reflection, and professional growth through collegiality become overlooked in favor of the summative purposes of accountability and assessment. To evaluate the impact of the portfolio practice on reflexivity, the researchers set up a study involving two different institutions: Ball State University, a large, public, comprehensive, Midwestern institution; and the University of Redlands, a small, private, liberal arts institution in Southern California. Green and Smyser intended to determine how teaching portfolios altered the meanings that prospective teachers attached to the concepts of teacher, student, classroom management, evaluation of teaching, professional growth, and reflective thinking.

The experimental and control groups of 32 and 36 students, respectively, from both institutions were administered the semantic differential instrument in the fall semester; in the spring semester the experimental group of 17 students from Ball State University and the control group of 20 from the University of Redlands participated in the research. The semantic differential method assigned a scale with values of 1 through 7 (semantic space) to the three dimensions of each concept (each concept was assumed to be characterized by the dimensions of evaluation, potency, and activity). These scales were used to perform factor analysis in order to plot the meaning an individual gave to a particular concept. The semantic
differential instrument developed for this study included six concepts (teacher, student, classroom management, evaluation of teaching, professional growth, and reflective thinking) with nine scales for each concept. The experimental group was guided in the process of portfolio development: the students were given the portfolio format designed by the investigators but had ultimate control over specific portfolio items to be considered for inclusion. The opportunities for portfolio sharing and mentoring were built into the curriculum schedule. Ongoing feedback was given by instructors.

Green and Smyser (1995) reported that the experimental group exhibited noticeable shifts in meanings they attached to the basic concepts of education after their training in the use of teaching portfolios. The shifts occurred in each of the scales for three concepts: evaluation of teaching, professional growth, and reflective thinking. Each of the three concepts were viewed as an active process that required complexity, active participation, and cooperation and exposed shifts in preservice teachers’ attitudes towards instilling such understandings in their future pupils. Those who used portfolios saw the six concepts as more valuable, more potent, and more active than they had at the beginning of the semester. However, the concepts of teacher, student, and classroom management were given a more negative connotation; the teacher was seen as “less energetic, and more passive, the students were seen as less intelligent, less successful, more passive, and less competitive, and classroom management was seen as less organized, and less sociable” (Green & Smyser, p. 52). Although unable to account for such negativity, the researchers briefly speculated that the students in the experimental group might have gained such apprehensions after their field experiences. The overarching conclusion of this research supported the claims that the use of portfolios positively changed student beliefs and attitudes with regard to evaluation of teaching, professional growth, and reflective thinking.

The only experimental study located by this literature review was Green and Smyser’s (1995) work, which contributed to understanding the potential of portfolios as reflective tools. Introducing the tension between the notions of portfolios as both assessment and reflective tools, the study did not proceed to determine what such a tension looked like in the
described context and how it impacted student learning. Instead, it concentrated on the quantifiable effects of the portfolio reflective practice.

Meyer and Tusin (1999) highlighted the tension between the perceptions of portfolios as evolving works versus showcases. The researchers assumed that whether students regarded portfolios as a product or process might be influential in their portfolio conceptualization and practice. Two groups of 10 students each were chosen for this study; those belonging to the first group had completed their final methods coursework, and those included in the second group had completed their student teaching. The sample was randomized: the first 10 students returning the permission slips were included. These groups were asked to complete a motivational survey with subscales for students, teachers, and parents. This study used one teacher subscale reflecting student pedagogical beliefs and consisting of two types of items: mastery-oriented and performance-oriented.

Statistically significant differences in how students reported their beliefs about process-oriented versus product-oriented approaches to teaching were found. Several compelling patterns of preservice teacher beliefs were revealed: a moderate pattern displayed higher endorsement of process-oriented beliefs towards teaching than product-oriented beliefs (12 out of 20 participants); a product perspective favored higher product orientation by endorsing performance (4 students); and a process perspective supported process goals more than product goals (4 students).

The general conclusion conveyed by Meyer and Tusin (1999) was that student experiences with portfolios did not include the idea of portfolio multiplicity. A reflection on different portfolio forms and purposes, their similarities and contrasts, and the variety of outcomes of portfolio use were not present in the student experiences. This research, however, did not specify the differences in the perceptions between the two groups of students to further inform the research on the purposive tension.

**Summary: Portfolios as Reflective Tools**

Conceptualized as reflective tools, portfolios are believed to be capable of fostering authentic learning and metacognitive processes. Schulman (1998) equaled portfolio construction to an ultimate ever-progressing act of theorizing as learners select, organize,
display, operate, and think about their learning experiences. Building on the idea of portfolios as supreme acts of reflection, an electronic format can offer opportunities for a nonlinear, interconnected, unique, and rich representation of learners’ intellectual work (Norton-Meier, 2003).

Empirical studies examining the impact of portfolio practice on student reflexivity suggest that portfolio development relies heavily on a number of factors, including student commitment to deliberate seriously, multiple opportunities for portfolio revisions, feedback from peers and instructors, and student understanding of a portfolio’s potential audience and purposes. The tension between the purposes of portfolios as assessment versus reflective tools is revealed in several studies in which the summative purposes of accountability and assessment dominated over the learning, reflective, and collegiate purposes of the portfolio practice. Studies to determine the relation between portfolio development and student learning commonly have been performed with a small sample of selected students and are difficult to compare because the majority of them (see Appendix A) used a qualitative tradition that avoids making generalizations but seeks understanding of specific situations.

**The Promise of ePortfolios**

With the advancement of technology, new visions of electronic portfolios promise to marry the two approaches (portfolios as assessment tools and portfolios as reflective tools) by balancing learner needs, in terms of making visible individual learning processes, and institutional needs, constructing a comprehensive assessment system (Stefanakis, 2002). In Snyder, Lippincott, and Bower’s 1998 paper, “The Inherent Tensions in the Multiple Uses of Portfolios in Teacher Education,” they came to the conclusion that

an essential element to using this tension [the dual purposes of support and accountability in portfolio development] constructively, is the belief that a key ingredient in the process of learning . . . is the maintenance of a diverse collection of process artifacts which represent work over time. This collection of artifacts is then used to make one’s practice visible, and becomes a basis for reflection in order to understand and improve one’s teaching [learning]. From the collection, different artifacts can be selected, organized and presented in different portfolios for different functions and different audiences. In this way, but not without peril, teaching, learning, assessment, and evaluation, can support each other. (p. 59)
Electronic portfolio systems, or ePortfolios, hold the promise to maintain a substantial archive of learner work and reorganize digital materials that can be presented in different ways for different purposes so that portfolio owners are able to extend formal and informal access to diverse audiences (Greenberg, 2004). Three types of ePortfolios emerge as a result of such electronic affordances (Greenberg): the showcase ePortfolio, the structured ePortfolio, and the learning ePortfolio.

The showcase portfolio enables authors to display and share specific examples of work with selected audiences in order to boost conversations about the value of their work as learners. Such collections can contain highlights of student curricular and extracurricular activities, references, reflections, and resumes. Reflections are an integral part of the showcase portfolio and go beyond the mere exhibition of artifacts. Reflections sustain the showcase portfolios, stimulate the formation of new connections, personalize new experiences, and map out future activities.

The structured ePortfolio serves the purpose of demonstrating student attainment of specific requirements. This kind of portfolio is structured around established learning outcomes, standards, or criteria that encourage systematic revision, evaluation, and comparison. Embedded in the content of the structured portfolio, sets of standards or criteria create a common framework for displaying student competencies, advising, and a sampling of student work to encourage institutional accountability and identifying curricular strengths and area for improvement. Such ePortfolios have the potential to nurture a cross-institutional collaboration and cooperation, which is the case with some professions that require the attainment of the uniform certification requirements. The structured portfolios support mentoring, enabling faculty to offer ongoing feedback and encourage students to discuss their work with peers, university-based educators, and outside evaluators.

Finally, the learning ePortfolio is used to organize pieces of work in progress. Portfolio authors need to spend time on projects that are evolving and changing in response to feedback, requirements, and authors’ developing understandings. Going back and forth between projects, portfolio authors make new connections and keep the organization of work as well thought out or disordered as is consistent with their learning styles. The
The communication that the learning ePortfolio initiates is crucial for portfolio owners in terms of facilitating meaningful discussions organized around the value of their developing work samples and soliciting feedback about specific issues and concerns. Conversations occurring within the context of the learning ePortfolio are not limited to course instructors, peers, and advisors, but involve collaborators, outside reviewers, and other interested parties. Greenberg (2004) concluded that the exploration of ePortfolio practice for learning, reflection, and assessment promises to advance learning and teaching.

EPortfolios move beyond the acts of collection, reflection, and assessment. Rather than simply imitating their paper counterparts, the nature of ePortfolios grant lifelong ownership and control over one’s individual portfolios that can be selectively shared with anyone, anywhere, and at any time (Treuer & Jenson, 2003). Besides having the power to allow easy, full, and direct access to personal records and control over their use and distribution, ePortfolios create contextualized environments within which learning occurs. The highest level of portfolio maturation, identified by Love et al. (2004) as “authentic evidence as the authoritative evidence for assessment, evaluation and reporting,” is associated with contexts, provided by the institution, program, educators, and students, that contain information about the institution, faculty, program, specific syllabi, assignments, additional help, resources, assessment criteria, and the student work sample and may include product description and work samples by portfolio authors. EPortfolios being embedded within social contexts prompt portfolio participants to be constantly aware of themselves in context, thinking about how what they are doing affects what they already know, about how they interpret ideas and activities in terms of learning, and how they might interpret new realizations. Context, within themselves and with others, becomes central. (Cambridge & Cambridge, 2003, p. 8)

Cambridge and Cambridge (2003) made a prediction that five elements of ePortfolio technology can present a viable solution to the task of enhancing contextualized learning:

1. The design element helps the user to re-purpose their working materials by means of annotations. Annotating documents allows for learners to articulate meanings, have ultimate control of the placement and visual appearance of annotations, and use specific portions of multimedia artifacts, which focus on the most important aspects of student activity.
2. The semantics element helps individual portfolios to communicate effectively with the institutional system by facilitating the selection and organization of student materials.

3. The factoring element assists the seamless integration of student materials into the comprehensive institutional system.

4. The community element allows a student to use a portfolio to be involved in collaborative practices with institutions, instructors, advisors, employers, peers, and community members. The electronic portfolio technology must facilitate membership in multiple, overlapping communities of practice.

5. The decentralization element exempts a user from relying on a single institution’s system. If standards were developed between institutions, a personal electronic portfolio tool could connect with multiple, potentially very different institutional systems, obtaining information about institutional information needs and standards for evaluation, receiving instructional materials which guide the process of reflection, publishing portfolios tailored from the working portfolio to particular audiences, and connecting with other learners: students, faculty, alumni, fellow citizens. (Cambridge & Cambridge, p. 14)

ePortfolios built on these elements offer great flexibility for learning, authentic assessment, and establishing sustainable learning communities of practice. Such a vision of ePortfolio development is far ahead of the current practice. Because of the novelty of the ePortfolio concept, no studies backed up by empirical data and detailing such practices could be located. However, fictional scenarios of the ePortfolio systems in action abound in educational discourse (ePortConsortium, 2003; Love et al., 2004; Treuer & Jenson, 2003).

The new vision attempts to resolve the tension of support for learning, assessment, and accountability using ePortfolios to expose various aspects of student learning processes in ways that require authentic assessment. The value of such ePortfolios is high for both students and institutions, whereby students benefit from the engagement with contextualized environments and institutions are able to repeat and enrich instructional implementation and use the accumulated data to make comparisons both across common tasks and across the same caliber of context specific information in order to gain insights into the learning processes of each student and assist with program assessment and revision (Love et al., 2004).

The tension between portfolios as assessment tools versus reflective tools can also be addressed through “the first, and most significant act of portfolio preparation, . . . the decision
on the purposes of portfolio” (Barton & Collins, 1993, p. 203). Knowledgeable mentors, who model portfolio practices in their teaching, learning, sharing, and collaboration with “the inclusion of new practices, and assessments, [to] be prepared for the individuality, and complexity of student thinking” (Meyer & Tusin, 1999, p.138), are required to deal with the purposive dilemma in the portfolio practice in higher education.

**ePortfolios: Tension Between Multiple Purposes Continues**

The task of changing of the purposes of electronic portfolios has been probed into by ePortfolio technology (Greenberg, 2004), but a tension between multiple portfolio purposes continues.

Corwin (2005) described an electronic portfolio system at Valley City State University, a member of the North Dakota University System. The problem faced by the institution revolved around struggling with how much of the portfolio should be prescriptive and the multiple portfolio purposes. The perceptiveness feature can be easily embedded within electronic portfolio templates that are organized around predetermined categories (Greenberg, 2004). Such templates make the process of uploading portfolio documents easy and swift. On the other hand, they tend to encourage the accumulation of student work, turning portfolios into “rattling shoeboxes” (Corwin). Electronic portfolio systems promise to prevent portfolios from acquiring “fluff” by nurturing rich feedback and dialogues that should validate the portfolio content. Multiple submission and revision opportunities and student control over what categories of people can view each work sample when both learning and showcase portfolios with the same work samples are maintained (Love et al., 2004) can potentially assist with resolving the purposive dissonance.

The technical maturity of ePortfolios can both help or hinder the solution to the dissonance. Gibson and Barrett (2003) suggested that electronic portfolio development that is focused both on the quality of student learning and its valid alignment to the standards and goals of education can be guided through the use of generic tools, such as word processing, HTML editors, multimedia authoring tools, portable document format (PDF), and other commonly used productivity tool software and customized systems involving servers, programming, and databases. Gibson and Barrett argued the advantages of customized
systems involve changing portfolio purposes, asynchronous and synchronous communications integrated into the portfolio processes, multiple group and individual roles and relationships that enhance the development of on-going dialogues, maximum use of hyperlinking to show the complexity and flexibility of the context, multiple data collection, low cost and sustainable servers, software, maintenance, and programming staff. On the other hand, the potential of generic tools to display the individual creativity of each learner, alignment of purpose and audience that have a single focus and reside in one portfolio, and the possibility for learners to invent their own ways of making linkages to a schema, can result in meaningful portfolio practice. Both approaches if used alone are likely to have a smaller impact: customized systems soon lose touch with the individuality of inquiry and expression of learners. [Generic tools] limit [their contribution] to a program’s validity, as well as accountability. . . . Which approach is better also depends upon the purpose and audience for the information within and connected to a learner’s portfolio. (Gibson & Barrett, 2003, p. 573).

Another challenge of technical maturity is the fact that the specifications of ePortfolios are at an early stage; thus there is a need for the interoperability of ePortfolios across different systems and institutions (Siemens, 2004). Siemens indicated that to accommodate the various ways of portfolio practice, such specifications encompass two considerations: the content created by portfolio authors and the formal record of achievement of portfolio owners. Siemens cautioned that the value of standards in ePortfolio development ought to be carefully weighed with the freedom and usability of the tools.

Jafari (2004) believes that the interoperability requirements should be defined in terms of common communication standards to facilitate the flow of data and common functional requirements supported across institutions. The concerns that could arise with tackling the interoperability issues are inevitably linked to the increasing control of institutions over electronic portfolios (Siemens, 2004).

Electronic portfolio systems, or ePortfolios, have many challenges to overcome. A novel idea in higher education, ePortfolios can be successful if the lessons learned from traditional portfolios are thoroughly reflected upon.
Summary: The Promise of ePortfolios

Electronic portfolios offer a promising future. By maintaining a substantial digital archive, portfolio owners will be able to reorganize and present their work in different ways for different purposes so that diverse audiences could be assigned access to selective portfolio components. Such portfolios will be easy to create and have distinctive characteristic features depending on their purposes: showcase ePortfolios will contain the highlights of student work, structured ePortfolios will be organized around a predetermined template, and learning ePortfolios will be built upon work in progress. Moving beyond the acts of collection, reflection, and assessment, electronic portfolios might potentially contextualize environments within which learning occurs and foster building learning communities of practice.

A new phenomenon in the landscape of higher education, electronic portfolios have not yet been researched extensively. Even though there is a lack of empirical studies determining electronic portfolios’ impact on learning, program assessment and institutional accountability, there exist speculation (Corwin, 2005; Gibson & Barrett, 2003) that the tension between the multiple purposes of support for learning, program improvement, and institutional accountability continues. The prescriptiveness of electronic portfolios, accumulation of “fluff” (Corwin), and loss of individuality of inquiry in favor of standardization are cited as posing potential dangers for electronic portfolio development.

Discussion

The findings of this literature review suggest that a critical, but balanced understanding of the portfolio phenomenon is not possible unless it is driven by sophisticated theoretical frameworks and draws on rich empirical evidence from both qualitative and quantitative perspectives, accounting for various contextual, organizational, and intellectual conditions. Educational literature reveals a rich body of theoretical portfolio research and scarcity of narrations on portfolio practices, which in most instances are situated in unique academic settings where the purposes of using portfolios vary, thus making them difficult to compare (Grossman, 2005). Nonetheless, such studies are particularly instrumental in disclosing portfolio tensions and ways to manage them constructively.
The overwhelming majority of studies on portfolio practices are qualitative, involving the participation of student volunteers (Avraamidou & Zembal-Saul, 2003; Breault, 2004; Darling, 2001; McKinney, 1998; Piper, 1999; Placier et al., 2001; Wright & Stallworth, 2002) versus larger random participant sampling (Green & Smyser, 1995). The dominance of qualitative research in this area can be rationalized by the reflective and intimate side of portfolios, allowing inferences about the value of portfolio uses to be drawn from careful analysis of portfolio products and individual interviews, usually after the completion of portfolios. Many studies reviewed in here (Borko, Michalec, Timmon, & Siddle, 1997; Darling; Milman, 2005; Stone, 1998; Wang, 2004; Wilson et al., 2003) described portfolio uses as contextualized within individual courses or sets of courses within an academic program.

Portfolio development is entangled in a web of tensions occurring as a result of the conflicting purposes of support for learning, program assessment, and institutional accountability. Used as assessment tools, electronic portfolios serve to make inferences about student growth by way of comparison of student performance across common tasks. Pressured to document student successful attainment of prescribed standards, institutions use electronic portfolios for aggregating and disaggregating statistics to measure institutional performance, whereby student learning is perceived as a mere institutional outcome.

Used as reflective tools, electronic portfolios have the potential to represent learners’ individual thinking patterns and unique constructions of knowledge, skills, and dispositions, the evaluation of which requires the substitution of comparative consistency with the evaluation of learners across the same caliber of context specific information.

The technical maturity of ePortfolios allows portfolio owners to collect, organize, present, reflect, and share their learning experiences in different ways for different purposes, but the tension between the multiple purposes of support for learning, assessment, and accountability continues to surface as standardization and interoperability issues are considered.

Though the reviewed literature clearly indicates the existence of tension between portfolio purposes, it is also evident that there is agreement that, in spite of such a tension,
Portfolios can serve multiple purposes (Klenowski, 2003; Long & Stansbury, 1994; Van Sickle et al., 2005; Wolf, 1999). Defining a purpose is an important decision made in the process of electronic portfolio development (Barton & Collins, 1993; Carney, 2001) that should be communicated to all the stakeholders from the very beginning of the process (Breault, 2004; Krauser, 1996; Ring, 2002; Stone, 1998).

Balancing the multiple purposes of portfolios is imperative in order for learners to maximize the potential of portfolio practice for their academic, professional, and personal development. Faculty are instrumental in helping students understand the disparities between theory and practice, product and process and the similarities between different portfolios (such as learning and showcase portfolios), thus influencing evolving student pedagogical beliefs and portfolio uses (Meyer & Tusin, 1999). Faculty also influence students by modeling the practice of portfolio assessment and support of learning in and beyond the classroom. Many teacher educators are studying their own practices in new and different ways by developing portfolios in which they discuss the changes in their relationships with preservice teachers and reflect on curriculum and assessment procedures. Ensuring timely and helpful feedback on student portfolios is another important aspect of faculty influence (Sickle, Bogan, Kamen, Baird, & Butcher, 2005).

Literature on electronic portfolios has mentioned the following factors as essential for approaching the portfolio tension constructively:

1. The creation of a conceptual portfolio framework that both meets the needs of students to support learning and accommodates institutional needs for accountability purposes (Barrett & Wilkerson, 2004).
3. Critical reflection and experimentation that are indispensable parts of courses (Anderson, DeMeulle, & Knowlton, 1996).
4. Knowledgeable and committed portfolio mentors and the presence of support structures (Green & Smyser, 1995; McKinney, 1998; Milman, 2005).
5. Enough time allowed for portfolio construction and redemption (Snyder et al., 1998).

EPortfolios have give rise to serious considerations of such factors (Cambridge & Cambridge, 2003).
Another important finding of this literature review suggests that the technological advancements offered by ePortfolios are ahead of pedagogy. For instance, although researchers (Ittelson, 2001; Treuer & Jenson, 2003) have speculated on the potential for electronic portfolios to become a universal academic electronic identity of individuals and institutions, the practical research on electronic portfolio systems is limited to descriptive studies (Corwin, 2005) or studies depicting the creation of static portfolio Web sites (eFolios) in ways that are not integrated with the rest of curriculum practices and occur within individual courses (Milman, 2005).

This literature review indicates that research is needed to evaluate the promise of electronic portfolios to encourage the reconciliation of the conflicting purposes of support for learning, program assessment, and institutional accountability in ways that demonstrates and deepens student individuality, reflection, and self-reflection rather than reduces learning to predetermined units of knowledge considered competent by external assessors. More research is needed to make judgments about how electronic portfolio development can best be addressed in ways that are sensitive to the needs of individual learners and are of value to institutions and programs in analyzing the quality of offered educational services and experiences.

The following chapters present and discuss a case study of one department that implemented ePortfolios to support student learning, program assessment, and institutional accountability and offer an insight on the way these multiple purposes co-existed and worked together and/or against each other in that department.
CHAPTER 3: RESEARCH METHODOLOGY

This chapter presents the rationale for the qualitative interpretive approach and case study methodology employed for this research. A description of the research context and participants, procedures for data collection and analysis, as well as ethical considerations, strengths, and limitations are included.

Case-study methodology was chosen to reveal the complexity and uniqueness of the research situation and to integrate maximum naturalistic generalization and transferability (Stake, 1995) in order to make these findings useful to both those involved in this research situation and those seeking to learn from it.

Qualitative Interpretive Approach

A qualitative interpretive approach relies on the premise that reality is socially constructed, complex, and ever changing, and, as such, involves a variety of perspectives, with variables that are complex, intertwining, and difficult (if not impossible) to measure (Glesne, 1999; Guba, 1990; Kaplan & Maxwell, 1994). The research focus rests on the immediate and local meanings of participants involved in a social situation, within which they construct their understandings and experiences (Gall, Borg, & Gall, 1996). The role of the researcher expands to both the examination of the phenomenon under study in its natural settings and attempts to interpret it in terms of the meanings that humans bring to it (Denzin & Lincoln, 2003), focusing on particular actors, in particular places, at particular times, and particular social interactions (Schwandt, 1994).

The qualitative interpretive approach was deemed appropriate for five reasons. First, the focus of this study was placed on “learning how individuals experience and interact within their social world, the meaning it has for them” (Merriam & Associates, 2002. p. 4), the very essence of interpretivism that seeks to give voice to the stories told from multiple perspectives. This study was particularly keen to bring forth the perspectives of students, faculty members, and administrators in one department who struggled to make sense and construct their meanings of the multiple purposes of electronic portfolios.
Second, this approach allowed for rich descriptions that contain insights and explanations of events through which individual and organizational processes and structures became transparent (Gioia & Pitre, 1990). Generating rich descriptions helped to reveal the human context of the phenomenon under study and to unmask the sophisticated mechanisms and causal effects behind it, and it permitted the researcher to attend carefully to the details and situated meanings occurring within the social situation.

Third, the qualitative interpretive approach called for inductive theory building, in which analysis, theory generation, and data collection were iterative, cyclical, and nonlinear (Gioia & Pitre, 1990). The iterative design proved to be particularly meaningful as the researcher was engaged in the continuous interplay between data collection and analysis. Throughout the case study, iteration, nonlinearity, and the cyclical nature of data processing allowed for saturated patterns and relationships to appear.

Fourth, the author of this case study acted as a participant researcher and was charged with the task of interpreting the meanings of actors in this social situation. As Schwandt (1994, p. 118) states,

> The inquirer [had to] elucidate the process of meaning construction and clarify what and how meanings are embodied in the language and actions of social actors. To prepare an interpretation is itself to construct a reading of these meanings; it is to offer the inquirer’s construction of constructions of the actors one studies.

To be able to provide accurate interpretations, the researcher interacted very closely with the key faculty participants and became involved in the life of one department implementing electronic portfolios for multiple purposes.

Finally, using the qualitative interpretive approach, the researcher was able to attend to the social, dialogic nature of inquiry (Guba & Lincoln, 1989) and keep close connections with study informants, who continuously gave input on the researcher’s tentative interpretations of structures, processes, actions, and events (Merriam & Associates, 2002).

Using the philosophical lens of qualitative interpretive approach, the case study of one department implementing electronic portfolios for the multiple purposes of support for learning, program assessment, and institutional accountability was designed and conducted.
Case Study Methodology

A case study has been defined as “…an intensive study of a single unit or a small number of units (the cases), for the purpose of understanding a larger class of similar units (a population of cases)” (Gerring, 2007, p. 37). This description encompasses both Orum’s (2001) idea of limiting a case study to a single case and Bennet’s (2001) expansion of a case study to a small number of cases that can be compared. Schrank (2006) noted that such an inclusive definition equates a case study to a research design that considers carefully (a) a wide range of data sources and analytical strategies and (b) a research site and population, in order to adequately address the research question at target.

A case study was particularly suited to telling an evolving story of one department implementing ePortfolios for the multiple purposes of support for learning, program assessment, and institutional accountability. Different perspectives that arose both from the stories of research participants and a range of other data sources allowed tapping into the impact of ePortfolios on learning, teaching processes, and outcomes in one department. The case study methodology allowed for revealing “what is ‘out there’ . . . [by] relating to interpretations made in ‘here’ (Internal to both the organization members under study and the researchers conducting the study)” (Gioia & Pitre, 1990, p. 587). The author acted as a participant researcher who was both an outsider and an insider to the department, and her position helped provide contextual and relevant data for this case.

The research case was chosen because of its uniqueness to illustrate the issue (Yin, 1994) of the multiple purposes of ePortfolios. The department functioned as a “bounded system,” in which multiple sources of data became available (McMillan & Schumacher, 2001), which permitted the creation of a holistic understanding of the phenomenon under study (Feagin, Orum, & Sjoberg, 1991).

Researcher’s Role

The qualitative interpretive approach and case study methodology position the researcher at the intersection of socially constructed realities arising within a particular social situation, “a bound system.” The researcher’s task is to carefully attend to the details, complexity, and situated meanings (Schwandt, 1994) of the research situation by listening,
asking questions, interpreting answers, being adaptive and flexible, and having a firm grasp of issues under study (Yin, 2002). The following section specifies the role of the researcher and explains its significance for this case study. To better illuminate the researcher function, short excurse into the researcher’s involvement with the eDoc electronic portfolio system is needed.

**eDoc Electronic Portfolio System**

The investigator’s interest in multiple purposes of electronic portfolios in higher education evolved from her extensive and intensive involvement with the eDoc electronic portfolio system at ISU. Developed as the result of a long-term collaboration between several academic units, including the Colleges of Agriculture, Business, Design, and Human Sciences; Information Technology Services; and the Center for Excellence in Teaching and Learning, eDoc functioned to allow undergraduate and graduate students to create individualized portfolios under a customized “theme” designed by a particular academic program, department, college, or employer. Such student portfolios would be used to collect and present evidence that demonstrated student academic and professional competence as well as to interact and collaborate with faculty and peers in a professional and scholarly manner.

eDoc was conceptualized to become a simple Web-based tool for student formative and summative assessment, advisement, showcasing of student achievement, employment, etc.. This vision had encouraged teams of users to design, develop, and implement multifaceted and individualized portfolio themes (interfaces or templates) tailored to the needs of participating students, academic programs, departments, and colleges (Nilakanta, Hassall, & Davis, 2007). Student users could create multiple electronic portfolios by choosing an appropriate interface from a list of program and departmental themes. Portfolio owners could upload and manage files in the allocated file spaces, add and edit reflections and artifacts, selectively share specific portfolios by allowing particular types of access, download portfolios onto their hard drives, and view and share comments given by guests and stakeholders with selected audiences.
The eDoc initiative was characterized by a relatively decentralized organizational structure, whereby each design team included representatives of all users (students, faculty, and staff) and took charge of scheduling and managing regular meetings. Each new team was encouraged to review existing eDoc themes to understand common eDoc functions and to articulate their “ideal” eDoc theme. Monthly university-wide meetings during the academic year immensely enhanced the progress of the initiative. In addition, periodic “show and tell” sessions showcased new eDoc designs and informed the ISU community of successes and challenges faced by teams and supporting units. To promote a collaborative spirit within the eDoc project, each team member was given access to the eDoc WebCT and Wiki spaces that featured eDoc documentation and allowed new teams to both see the history of the project and become part of it (Nilakanta et al., 2007).

**Researcher's Role in eDoc**

During a period of three years, from 2003 to 2006, the researcher actively participated in the design, development, and implementation of the eDoc electronic portfolio system. In her position as the eDoc graduate assistant, she was responsible for guiding college design teams consisting of ISU faculty, staff, and graduate and undergraduate students through a disorganized process of conceiving, testing, piloting, and implementing custom-tailored electronic portfolios. She had first-hand experience of negotiating the specifications of such custom designs with people of different technical and pedagogical backgrounds. It was her responsibility to establish communication and work flow within and beyond college teams in such a manner that they could successfully navigate through the complexity of the many change processes that occurred as the teams introduced custom-designed electronic portfolios to their programs and colleges. She also assisted with testing the eDoc software, reporting bugs, and communicating software improvements to the eDoc programmer.

The researcher also utilized the eDoc system for compiling her own learning and employment electronic portfolios. In August 2006, she was hired by the Center for Excellence in Teaching and Learning to become an Instructional Development Specialist, one of whose primary duties included technical and pedagogical support of electronic portfolios on the ISU campus.
Researcher's Involvement with One Department

Throughout her work as the eDoc graduate assistant, the researcher had been very reflective about the value of electronic portfolios for learning, teaching, program assessment, and institutional accountability. As a change agent, she had come to perceive electronic portfolios as a complex innovation that ought to be managed strategically in order to support meaningful teaching and learning. She also acquired a habit of reflecting upon her own practice on a deeper level, where she learned to move from internal thinking about electronic portfolios to external reflection (Etherington, 2004) and sharing her experiences with the many eDoc participants. It was through meaningful discussions that occurred during the eDoc initiative’s monthly general meetings (Nilakanta et al., 2007) that the researcher became aware of the outstanding impact that electronic portfolios had been making on one department and that members of that department were willing to invite the researcher to conduct a careful examination of the complexities and tensions created by the multiple purposes of electronic portfolio development.

The researcher forged strong professional and personal connections with the leaders of that department’s eDoc team and became involved in a range of departmental electronic portfolio activities, including but not limited to the delivery of eDoc training to the department’s faculty, staff, and students. She frequently was invited to the departmental faculty retreats and committee meetings to speak about the pedagogical implications of electronic portfolios. The investigator also co-authored two grants to help the department obtain funds for sustaining the eDoc electronic portfolio system. One grant received internal funding from ISU; the second was being revised for the National Science Foundation at the time of this writing.

Participant Researcher

The position of the participant researcher that resulted from her engagement with the departmental issues dramatically helped to facilitate the research process. The outsider to a “bound system” is often perceived as “an all-knowing, formalistic, controlling evaluator” (La Belle, Moll, & Weisner, 1979, p. 89). The outsider has a good understanding of what is wrong with the system and, for the sake of objectivity, remains outside and/or intervenes in
predictable ways. In this research situation, the position of the outsider might have yielded different results than those described in the next chapter. This could have occurred due to the fact that the process of the implementation of electronic portfolios for multiple purposes had been disorganized, unpredictable, and hard to penetrate for the outsider. The position of the participant researcher allowed her to be in frequent contact and attendance in the department and gain insights and a more balanced view of the behaviors that might not have been displayed to the outsider.

The participant did not have a desk at the department, but went to the site several days a week because of the frequent training, departmental meetings, and grant collaborations. This role made this research particularly rewarding and challenging. It was rewarding in the sense that the investigator was able to see the results of her work and “really” know what was going on with electronic portfolios in this context. On the other hand, the responsibility for collecting the research data, performing formal and informal observations, interviewing, collecting documentation, and writing a research journal added value and pressure to her position. She was constantly aware of her multiple research roles and had to demonstrate sensitivity to local circumstances and effectiveness in working with others (La Belle et al., 1979, p. 89).

**Researcher’s Biases**

As a qualitative researcher, the author was forced to consider her biases when she designed, developed, and analyzed this case study. Over the course of the entire research, the investigator had been very passionate about the topic and believed in the value of using electronic portfolios for multiple purposes. Speaking to students, faculty, and staff in the department, she always disclosed her preference for electronic portfolios as reflective tools to document student growth.

The status of the researcher as a field worker (Punch, 1994) had a profound effect on this case study. The author had been visible in the department but not tied with any contractual obligations and/or expected to deliver predictable results within a set period of time (Punch, 1994). She independently judged when and how to conduct the research
procedures, and her activities were shaped by her goals as well as epistemological and methodological commitments (Schwandt, 1994).

Her personal friendship with the three faculty members featured in this research might have influenced the way she perceived portfolio development in this department. Because all three served as gatekeepers to the department and eased the investigator’s entrance into the research situation, their perspectives undeniably had an effect on the author’s thinking. It was essential to this case study that the researcher was perceived by the participants as an investigator willing to learn with and from those involved in this situation. Access and acceptance that came as a result of the warm recommendations given to the researcher by the three faculty members helped to avoid frustrations associated with being new to the department and allowed her to win trust from this community.

**Research Site and Participants**

The Department FSHN became a prominent part of the eDoc electronic portfolio initiative in Fall of 2003. By the Spring semester of 2006, the FSHN theme (portfolio interface) was most mature in the eDoc project, having gone through several iterative stages of design, development, and implementation. By Fall of 2006, the department had infused its undergraduate curriculum with mandatory electronic portfolio activities that were documented in the portfolios of about 200 students. The strategic choice of the site and population for this case study helped the researcher to ultimately focus on particular events in a specific context, the Department of FSHN, while seeking contextual understanding within the boundaries of this academic unit (Stake, 1995).

The design of the first version of FSHN eDoc started without student participation. Its goal was to support student learning and facilitate program assessment and institutional accountability. Thus, the FSHN eDoc theme was envisioned (a) to afford opportunities for students to reflect on their learning, (b) to serve a range of courses in the undergraduate program of dietetics as well as program and departmental policies, and (c) to facilitate the collection of qualitative data for program improvement and accountability/assessment. To accomplish these tasks the first portfolio interface was designed around departmental learning outcomes.
After the first pilot of the electronic portfolio template, the FSHN eDoc faculty team took student feedback into account and suggested adding a new “Add Ability” feature to the portfolio interface. This unique feature made the rigid portfolio structure more flexible and allowed students to create spaces for artifacts and reflections beyond predetermined learning outcomes identified by the program.

**Research Site**

The Department of FSHN was jointly administered by the Colleges of Agriculture and Human Sciences and housed 40 faculty members, 25 staff members, 63 graduate students, 10 post-doctoral fellows and 309 undergraduate students (Department of Food Science and Human Nutrition [FSHN], 2007). The Center for Designing Foods to Improve Nutrition (CDFIN), Center for Crops Utilization Research (CCUR), Center for Research on Dietary Botanical Supplements and NASA Food Technology Commercial Space Center were directly associated with the department’s research activities and its mission to conduct research in food science, nutrition, and related areas and contribute to the health and well-being of the state of Iowa, the American nation and the world.

The department was dedicated to promoting curricula, courses, and training in food science and human nutrition with careful consideration of the needs of its students. It offered undergraduate majors in Dietetics, Food Science, and Nutritional Science; undergraduate minors in Food Safety, Food Science, and Nutrition; and graduate majors, such as (a) Master of Science (M.S.) in Food Science and Technology, (b) M.S. in Nutrition, (c) Master of Family and Consumer Sciences (M.F.C.S.) in Dietetics, (d) M.F.C.S in Nutrition, (e) Doctor of Philosophy (Ph.D.) in Food Science and Technology, and (f) Ph.D. in Nutrition. The department was accredited by the American Dietetics Association (ADA), the nation’s largest organization of food and nutrition professionals.

**History of Outcomes Assessment in the Department**

The department was consistently examining the quality of student learning by collecting data from multiple and diverse sources. The departmental Outcomes Assessment Committee was actively seeking to understand what FSHN undergraduate students could do
with their professional knowledge and skills and how this kind of information could be used to enhance subsequent learning. This committee was held responsible for the formulation of the Outcomes Assessment Plan, preparation of survey instruments, analysis of data, and establishing communication with the FSHN Curriculum Committee to implement changes in the curriculum.

In August 2002, the Outcomes Assessment Committee invited Mary Huba, the co-author of the influential book *Learner-Centered Assessment on College Campuses: Shifting the Focus From Teaching to Learning* (Huba & Freed, 2000), to conduct an assessment strategies and methods workshop in which the following assessment process was proposed to the department:

1. Formulate statements of intended learning outcomes;
2. Develop or select assessment measures;
3. Create experiences leading to learning outcomes;
4. Discuss and lead assessment to improve learning.

Huba explained that the move to learning outcomes assessment involved a fundamental shift from teaching to learning: from teaching passive students to facilitating their active learning; from a concern of “what to teach” to “why and how”; from examining one’s own teaching practices to considering the variety of relationships with the institution within which teaching and learning occurred.

In light of the proposed assessment strategies, the committee developed a 2002 FSHN Goals Plan (Reitmeier, 2006), which included a number of steps to enhance outcomes assessment in the department. The first step emphasized helping FSHN faculty members to think in terms of outcomes rather than content. Faculty were encouraged to use different strategies for teaching and learning and combine traditional methods of lecturing and reading with creating opportunities for students to participate in group discussions, practice by doing, teach others, and make immediate use of their learning. The second step included the articulation of general outcomes for FSHN majors, which were anchored to the guidelines set forth by Institute of Food Technologies and American Dietetic Association. The learning
outcomes of the Colleges of Agriculture and Human Sciences served as a foundation for formulating FSHN vision of general learning outcomes.

The third step called for mapping the curriculum and stimulating faculty efforts for writing out course-specific outcomes statements and fitting them within a larger picture of curricular activities of the Department of FSHN.

In accordance with this vision, the Outcomes Assessment Committee launched a new comprehensive outcomes assessment plan, whereby 11 FSHN undergraduate learning outcomes were developed based on the College of Human Sciences classification of learning outcomes (Appendix B). These FSHN outcomes were grouped into four categories of communication, critical thinking and problem solving, social concerns, and ethics and technical skills. In addition, program-specific outcomes that related to the technical content of majors were devised for each major.

To measure the degree to which such outcomes are met by FSHN undergraduate students, the Outcomes Assessment Committee suggested using several strategies, including direct (course assignments, projects, lab performance, oral presentations, poster sessions, instructor and peer-evaluation, observation checklist, student/instructor conferences, exams/quizzes, etc.) and indirect (student reflections and self-assessment, final course assessments, exit surveys, portfolios, etc.) measures of assessment. Paper-based and electronic portfolios had become increasingly important as outcomes assessment moved to the forefront of departmental activities.

*ePortfolios in the Department*

ePortfolio development became particularly visible in one of the departmental programs, the didactic undergraduate program in dietetics, in the Fall Semester of 2004, following the eDoc electronic portfolio pilot in the FSHN 110 Orientation Seminar. One year earlier two dietetics faculty members, an Outcomes Committee member and the Dietetics Program director had joined the eDoc electronic portfolio initiative. After a series of discussions with the eDoc programmer, several prototypes of the FSHN electronic portfolio template, intensive discussions with colleagues, and time-consuming software testing and
debugging, these two faculty members had made the decision to make a move to the mandatory use of electronic portfolios in one course, FSHN 110 Orientation Seminar. Because FSHN 110 Orientation Seminar was a required course for all incoming FSHN freshmen, it presented a wonderful opportunity for introducing new students to the concept of electronic portfolios. The pilot turned out to be successful and useful to the department, whose electronic portfolio template was redesigned upon student and faculty feedback. Positive student feedback encouraged the Outcomes Committee member and the Dietetics Program Director to seek FSHN administrative support. The Associate Department Chair stood by the two pioneering faculty members and urged the Outcomes Committee to investigate the value of electronic portfolios for the multiple purposes of support for learning, program assessment, and institutional accountability. In the Fall of 2005, the Outcomes Committee presented a working document entitled “FSHN Department Outcomes, required courses and mandated portfolio assignments” (Table 3.1; see Appendix C for the full version of the document). This document specified:

1. The degree to which each FSHN course addressed departmental outcomes; and
2. Mandatory learning activities and assignments in each FSHN course to be included in student electronic portfolios.

It was envisioned that FSHN students would include course work in their electronic portfolios and be able to keep track of their progress through self-reflection. Instructors and administrators would use rich data from student portfolios to reflect on program assessment and departmental accountability. Figure 3.1 shows the timeline for electronic portfolio development in the department.

The case study sliced out a period equal to two academic semesters (Fall 2005-Spring 2006) when electronic portfolios were required to be used throughout the FSHN curriculum. The didactic undergraduate program in dietetics was the most advanced among the FSHN programs with about 100 students developing eDoc portfolios in all dietetics courses. Other programs were probing into the new phenomenon and looked to the dietetics program and FSHN administration to provide leadership and model this practice.
Table 3.1. FSHN Department Outcomes, Required Courses and Mandated Portfolio Assignments (fragment of the working document)

<table>
<thead>
<tr>
<th>Department Outcomes</th>
<th>Courses required for specific FSHN majors used to meet department outcomes and artifacts &amp; evaluation strategies used to demonstrate outcome achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN graduates will be able to:</td>
<td></td>
</tr>
<tr>
<td><strong>Communication (C)</strong></td>
<td></td>
</tr>
<tr>
<td>C. 1. Communicate effectively with others in one-on-one, small-group, and large-group situations.</td>
<td></td>
</tr>
<tr>
<td>FSHN 110 -Professional interview paper -Written self-reflection -Instructor evaluation</td>
<td>FSHN 110 -Professional interview paper -Written self-reflection -Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 214 -Food prod oral presentation -Instructor evaluation rubric -Written self-reflection</td>
<td>FSHN 214 -Food prod oral presentation -Instructor evaluation rubric -Written self-reflection</td>
</tr>
<tr>
<td>FSHN 466 -Counseling Project reports -Written self-reflection -Instructor evaluation</td>
<td>FSHN 472 -Oral presentation videotape -Instructor evaluation</td>
</tr>
</tbody>
</table>

Figure 3.1. Timeline for electronic portfolio development in the department and this case study.
**FSHN eDoc Electronic Portfolio Template**

At the time of this research the FSHN eDoc electronic portfolio template was used throughout the FSHN curriculum. After several iterative rounds of design, development, testing, and debugging that occurred with active participation of FSHN faculty and undergraduate students, the FSHN eDoc template included the following functionality:

1. Multiple FSHN eDoc portfolios could be created by the same portfolio user.
2. FSHN portfolios could be exported out of the eDoc system in the form of static Web pages.
3. FSHN portfolios had different views depending on the audience (portfolio owners, guest, and evaluators) accessing them.
4. Shared portfolios were searchable by category (key words) and portfolio status (new, in progress, and retired).

Portfolio owners saw two parts in the navigation bar: *Tools* with common eDoc functionalities and *Options*, custom-created for FSHN (Figure 3.2). *Tools* included:

- Theme-specific portfolio *Directions* to explain the structure of the eDoc FSHN portfolio.

![Figure 3.2. eDoc FSHN electronic portfolio template: Entrance page (captured on 6/20/06)](image-url)
• **Share your Portfolio** feature to allow portfolio authors to give individuals or a group of individuals access to their portfolio(s). Portfolio owners assigned the roles of guest and evaluator and notified those who were granted access through email. Guests had the privilege to view the portfolio and evaluators could comment on it and make comments available to the portfolio owner.

• **Manage Your Repository** to allow portfolio owners to upload files to the allocated personal spaces and manage them. Such repositories contained all files whether or not they were connected to a specific portfolio.

• The **Add Ability** feature for portfolio owner to create additional spaces for reflections and artifacts that went beyond the suggested departmental structure (as presented in Options).

When the portfolio was viewed by guests and evaluators, only Directions appeared in the Tools part of the navigation bar.

The portfolio Options were organized around four core ability areas of Communication, Problem Solving, Social Concerns/Ethics, and Technical Skills as defined by the department. Each ability option of the portfolio contained spaces for the description of a specific ability; student overall reflection on the ability, called Evidence of Ability; a list of artifacts; and reflections on artifacts associated with that ability (Figure 3.3).

The Technical Skills section was designed to be dependent on student majors. After users specified their majors and programs in the Biography section in the Introduction area of their portfolio, the system generated the Technical Skills page containing a list of skills and competencies defined by the American Dietetic Association for dietetics and nutritional science majors. A different page with the requirements of the Institute of Food Technologists was generated for food science majors. Figure 3.4 shows the Technical Skills portfolio page generated for dietetics majors.

The Introduction area of the portfolio contained user-managed space to explain the portfolio purposes, make overall comments, and share information about student majors and programs (Figure 3.5).

Another section of the portfolio, called Overview (Figure 3.6), had an easy-to-follow table of student artifacts and reflections illustrative of the connection between included portfolio artifacts and reflections and departmental ability areas. The overview table was generated by the eDoc system as users developed their portfolios by writing reflections and
Figure 3.3. eDoc FSHN electronic portfolio template: Communication ability option (captured on 6/20/06)

<table>
<thead>
<tr>
<th>Student Name goes here</th>
<th>Food Science and Human Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tools</strong></td>
<td><strong>Communication Outcomes</strong></td>
</tr>
<tr>
<td>Directions</td>
<td>• Communicate effectively with others one-on-one, in small groups, and in large groups.</td>
</tr>
<tr>
<td>Share your Portfolio</td>
<td>• Prepare and deliver technical information to the public orally and in writing.</td>
</tr>
<tr>
<td>Manage your Repository</td>
<td>• Prepare and deliver technical information to professionals orally and in writing.</td>
</tr>
<tr>
<td>Add Ability</td>
<td></td>
</tr>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td><strong>Core Abilities</strong></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Problem-solving</td>
<td></td>
</tr>
<tr>
<td>Social Concerns/Ethics</td>
<td></td>
</tr>
<tr>
<td>Technical Skills</td>
<td></td>
</tr>
<tr>
<td>Other Abilities</td>
<td></td>
</tr>
<tr>
<td>Overview</td>
<td></td>
</tr>
</tbody>
</table>

---

Figure 3.4. eDoc FSHN electronic portfolio template: Technical Skills page for dietetics majors (captured on 6/20/06).

<table>
<thead>
<tr>
<th>Student Name goes here</th>
<th>Food Science and Human Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tools</strong></td>
<td><strong>Technical Skills Outcomes</strong></td>
</tr>
<tr>
<td>Directions</td>
<td>Departmental outcomes in the area of technical skills have been adapted from the lists of skills or competencies published by the relevant professional societies for our majors, The American Dietetic Association (for the Dietetics and Nutritional Science majors) and the Institute of Food Technologists (for the Food Science majors).</td>
</tr>
<tr>
<td>Options</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td></td>
</tr>
<tr>
<td><strong>Technical Skills</strong></td>
<td>Professional Skills and Abilities required for Bachelors Program in Dietetics</td>
</tr>
<tr>
<td>Dietetics</td>
<td>1. Use oral and written communication in presenting an educational session for a group.</td>
</tr>
<tr>
<td></td>
<td>2. Counsel individuals on nutrition.</td>
</tr>
<tr>
<td></td>
<td>3. Document appropriately a variety of activities.</td>
</tr>
<tr>
<td></td>
<td>4. Explain a public policy position regarding dietetics.</td>
</tr>
<tr>
<td></td>
<td>5. Use current information technologies.</td>
</tr>
<tr>
<td></td>
<td>6. Interpret medical terminology.</td>
</tr>
<tr>
<td></td>
<td>7. Interpret laboratory parameters relating to nutrition.</td>
</tr>
<tr>
<td></td>
<td>8. Apply microbiological and chemical considerations to process controls.</td>
</tr>
<tr>
<td></td>
<td>9. Interpret statistical data as used in dietetics.</td>
</tr>
<tr>
<td>Other Abilities</td>
<td></td>
</tr>
<tr>
<td>My Goals</td>
<td></td>
</tr>
<tr>
<td>Overview</td>
<td></td>
</tr>
</tbody>
</table>
Figure 3.5. eDoc FSHN electronic portfolio template: Introduction section (captured on 6/20/06).

Figure 3.6. eDoc FSHN electronic portfolio template: Overview.
attaching artifacts to the ability areas of Communication, Problem Solving, Social Concerns/Ethics, and Technical Skills. The overview table contained the name of the ability area and a space for displaying the links to artifacts and reflections associated with that area. Artifacts and reflections could be accessed from the table for further editing.

The interface of the eDoc FSHN electronic portfolio template continued to change after this research was completed. In the Summer of 2007, a new interface with new functionality was introduced.

**Case Study Participants**

**Faculty Participants**

To represent different perspectives on electronic portfolio development in this department, the researcher carefully considered the research participants. Being amidst the departmental efforts to implement electronic portfolios, the researcher had access to the key figures of the process. The three faculty members in this case study were the Academic Adviser/Outcomes Committee member, Dietetics Program Director and Associate Department Chair. All three were active eDoc participants and proponents of using electronic portfolios for multiple purposes; all three were tied to different organizational levels of the department and represented different degrees of administrative power; all three had a deep understanding of how the department was managing the implementation of electronic portfolios; and all three offered their unique analysis of the process and made themselves available to the researcher multiple times, whether for formal interviews or informal reflective conversations.

Table 3.2 details the faculty participants’ gender, number of years in the current position, and number of years teaching. Each participant is then described with regard to the level of activism in the ePortfolio implementation process in the department.
Table 3.2. Overview of Case Study Faculty Participants.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Committee Member/Adviser</th>
<th>Program Director</th>
<th>Associate Department Chair</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>Female</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td># of years in current position</td>
<td>6</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td># of years teaching</td>
<td>6</td>
<td>11</td>
<td>29</td>
</tr>
<tr>
<td>Used portfolio development in classes taught</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

**Level of participation in the process of ePortfolio implementation**

- An active member of the Outcomes Assessment Committee.
- Made numerous presentations to FSHN faculty about the value of electronic portfolio development. Initiated many individual conversations with faculty members about electronic portfolios.
- Effectively used portfolios for academic advising and in her teaching.
- Joined the eDoc electronic portfolio project at its inception. Helped with the design, development, testing, and piloting of the FSHN template. Participated in student and faculty training of eDoc and contributed useful Portfolio Help resources.
- Actively supported electronic portfolios in the didactic undergraduate program in dietetics.
- Modeled portfolio practice in her classes and encouraged other faculty in her program to do so.
- Was visible in departmental conversations about different purposes of electronic portfolios by providing data from her classes.
- Founded and participated in the creation of the FSHN Department Outcomes, required courses, and mandated portfolio assignments document to infuse electronic portfolio practice throughout the department.
- Brought up the issues of portfolio development at numerous departmental meetings and retreats.
- Was carefully leveraging the pedagogical and technological issues of electronic portfolios in the department.
- Initiated and participated in the writing of the internal grant to further support portfolio movement in the department.
- Led the writing of two grants to support portfolio development in the department. One grant received internal funding from ISU; the second remained under revision at the time of writing.
**Student Participants**

The three student participants in this study, Gregory, Sarah, and Megan, were selected on the basis of the following criteria:

1. All three represented different stages of academic progress: Gregory was a freshman, Sarah was a junior, and Megan was a senior.
2. All three took required FSHN courses in which electronic portfolio development was infused.
3. All three felt strongly about the advantages and disadvantages of electronic portfolios and volunteered to voice their opinions with the researcher.
4. All three allowed the researcher to access their electronic portfolios and provided in-depth explanations of portfolio contents.

Table 3.3 details the academic status, the major, and gender of each student participant and the number of ePortfolio-infused classes each took. It also specifies their degree of involvement with their ePortfolios.

<table>
<thead>
<tr>
<th></th>
<th>Gregory</th>
<th>Sarah</th>
<th>Megan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Academic status</strong></td>
<td>Freshman</td>
<td>Junior</td>
<td>Senior</td>
</tr>
<tr>
<td><strong>Major</strong></td>
<td>Dietetics</td>
<td>Dietetics</td>
<td>Dietetics</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Male</td>
<td>Female</td>
<td>Female</td>
</tr>
<tr>
<td># of classes taken in which electronic portfolio development was infused</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Included optional artifacts beyond class requirements</td>
<td>Yes (included three optional artifacts plus reflections)</td>
<td>No</td>
<td>No (but swapped one mandatory artifact for another, in her opinion, a better example of her performance)</td>
</tr>
<tr>
<td>Expanded the FSHN portfolio template by adding menu items</td>
<td>Yes (added the Leadership menu item to his FSHN portfolio template)</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
In summary, the research site and population for this case study offered rich venues for understanding the intricacies of multiple purposes of electronic portfolios in higher education.

**Data Collection**

Collection of data (both new and additional), coding, and discovering new repositories of data (Gerring, 2007) went in iterative cycles as the researcher developed a deeper understanding of and relationships with the key processes and participants of this case study. The collection of original data occurred by way of several procedures: individual semi-structured interviews; student electronic portfolios; course, program and department documentation; and observations and participant feedback of research participants. The researcher diligently maintained a reflective journal throughout this case study.

**Semi-Structured Interviews**

Semi-structured interviews took place in the form of one-time formal events when individual student and faculty participants were invited to open-ended conversations about their use and perceptions of the value of electronic portfolios. The semi-structured interview approach was designed on the basis of Pawson and Tilley’s (1997) suggestion that the nature of the interview (highly versus lightly structured) is driven by data, whereby lightly structured interviews have the potential to use the rich knowledge of participants to co-construct explanations of the phenomenon of the study.

Because all participants in this study were approached as knowledgeable insiders—not mere informants, but rather co-discoverers and contributors to the knowledge base—the semi-structured questions were found suitable for addressing the major research concerns, such as: What do electronic portfolios offer to support: (a) learning, (b) program assessment, and (c) institutional accountability in higher education settings and this department.

The researcher was highly cognizant of the careful use of educational terminology (program assessment, institutional accountability) during the interviews in order to not alienate the student participants. Although this terminology was used extensively in interviews with the faculty members, the questions were rephrased for the students. To
exemplify, instead of referring to institutional accountability, the researcher asked who else in the department, besides these students and course instructors, would be interested in their electronic portfolios, why such interest might arise, and what their electronic portfolios would tell about the department. Other examples are included in Appendix D.

During the semi-structured interviews, students and faculty were encouraged to take long pauses before responding and to paraphrase and reformulate their ideas to ensure the richness of data. Moreover, two student participants who reached the researcher via email immediately after the interview took a step back and re-voiced their opinions. Such reflexivity during and after the semi-structured session was highly desirable, given that this case study thrived on the rich data descriptions and openness of research participants.

**Student Electronic Portfolios**

The student participants shared their electronic portfolios with the researcher. In fact, all three students wished to receive the researcher’s feedback, though they attached different degrees of importance to it. Gregory was looking for encouragement and validation for putting extra effort into his electronic portfolio. He expressed the desire to see the researcher’s eDoc portfolio, although the researcher used a different template. Sarah felt her electronic portfolio satisfied all academic requirements, whereas Megan made contact with the researcher after the semi-structured interview and invited the researcher to see how she expanded her electronic portfolio after the interview.

**Course, Program, and Departmental Documentation**

The official documentation, such as FSHN course syllabi, electronic portfolio assignments, and assessment strategies, offered rich data that became accessible to the researcher through the password-protected online grid entitled “FSHN Department Outcomes, Required Courses and Mandated Portfolio Assignments” (Appendix E) created for the program and departmental use by the Outcomes Assessment Committee. This grid served as a visual representation of the infusion of electronic portfolio activities throughout the FSHN curriculum and allowed any FSHN instructor to upload samples of portfolio
assignments and assessment strategies for further viewing by FSHN faculty, administrators, and reviewers. The researcher had access to all documents contained in this environment.

In addition, the leaders of the didactic undergraduate program in dietetics, who piloted the use of electronic portfolios in the department, shared two important self-studies that were carried out by the dietetics program in place of the 2003 program assessment and institutional accreditation. Both of these documents described the vision and provided guidance for implementing electronic portfolios for multiple purposes in the program and department in the next 5 years. These documents oriented both the dietetics program and the department towards using portfolios for support of learning, program assessment, and institutional accountability. The above-mentioned documentation existed independently of this case study and proved to be valuable data sources.

**Observations**

The researcher spent a considerable amount of time in the department during and after this research. Her presence was interpreted as that of an eDoc electronic portfolio expert and validated by the three authoritative gate keepers: the Academic Advisor/Outcomes Committee member, Dietetics Program Director and Associate Department Chair. The researcher attended all important departmental events concerning electronic portfolios, such as Outcomes Committee meetings, departmental faculty retreats, portfolio seminars, workshops, etc., thus engaging in both unobtrusive and direct observation of events as they occurred in the chosen department. The researcher took observations notes during or immediately after such events.

The faculty in this department were acutely aware of the author’s role as a participant researcher. The researcher uncovered her status every time she was introduced at the faculty gatherings. Under such conditions, the investigator could not impose any controls or constraints on the faculty participants’ behavior; rather constraints were placed on the researcher who had to be aware of the organizational culture and her status in the department. These observations contributed to collecting new descriptive information about the research site and population and helped to begin identifying contingencies; though general and vague
at first, they became more focused as this research progressed and a deeper understanding of organizational processes and procedural knowledge was gained.

**Research Journal**

The researcher kept a research journal throughout this case study. All significant events, including semi-structured interviews, informal conversations, departmental meetings, were carefully chronicled. The journal became an essential part of this qualitative research and a way to both triangulate data and locate complex and multilayered relationships that defined this research site. As the author’s understanding of the case study was constantly evolving, the journal functioned as a testing vehicle for different ways of documenting and telling a story of one department using the researcher’s personal and academic voices as well as the voices of her participants.

**Causal Pathways and Complexity of the Research Situation**

Bennett and Elman (2006) assumed that methodological choices must take into account the characteristics of the phenomenon under study. Seeking to understand and explain the complexity of this case, the author looked for complex causal relationships in the disorganized, multi-layered, organic, and complicated practice of electronic portfolios in the department. A case study methodology was particularly suitable for revealing such causal relationships through path-dependent explanations.

**The Concept of Path Dependence**

The concept of path dependence is borrowed from political science, where it is frequently employed to describe causal complexity and construction of verifiable knowledge statements. In this case study, path dependence is interpreted as a sequence of four elements: causal possibility, contingency, closure, and constraint (Bennett & Elman, 2006).

*Causal possibility* is associated with the idea of several possible alternatives that present themselves at any given period of time; that is “causal possibility suggests that more than one path [of development] can be taken” (Bennett & Elman, 2006, p. 252). *Contingency* then implies an intervention of a random or unaccounted event and/or a factor that determines the path taken. Interpreted in this way, any path of development becomes highly contingent
and the choice of path is impacted by closure, which indicates the narrowing down of possibilities. This means that closure makes some causal pathways become more likely than others (Bennett & Elman). Finally, once a path is selected, it is constrained by processes that keep all actors on it. “Constraint suggests that the actors are tied to the path that is chosen or would face high costs in moving off this path once it is established” (Bennett & Elmann, p. 252). These four elements can be represented as a continuum, in which the time of plausible possibilities is interrupted by one or more random events that impact and narrow down the choice of possibilities to the one path on which the actors are constrained to remain.

Bennet and Elman (2006) focused on the role of contingency and constraint in path dependence, where contingency functions as an unexpected event(s) that generates positive feedback constraining actors to the chosen path. In these authors’ classification there are two types of contingency:

1. Exogenous (either potentially explicable or unexplainable) to the main causal story up to that point: a case study can help to theorize on the contingent period.
2. Stochastic and irreducibly unexplainable: a case study can help identify and explain random and consequential events.

Mahoney and Schensul (2006) believe that the concept of path dependency necessarily includes some form of contingency, the understanding of which helps to illuminate the constraints in selecting and keeping to a path. Constraints are then viewed as a chain of events marked by some kind of causal linkage and degree of sufficiency that makes the outcomes of one step taken on the path shape the other. Thus each successive step down the path increases the likelihood that a particular event or choice will be repeated and/or the magnitude of its subsequent manifestations. Positive feedback is often associated with a tipping point, where the causal pathway becomes fixed after the causal variable increases past a given point. (Bennett & Elmann, 2006, p. 256)

The dynamics of path dependency is contingent upon the sequence of events and processes happening in an actual social context. The path dependence dynamics characterized by increased returns (A → A → A → A → A) pictures the kind of equilibrium where positive feedback reinforces, enhances, and maintains the structures of institutions and powers of actors. Negative feedback dynamics (A → B → A → D → A) shows how equilibrium is restored after a period of increasing negative feedback effects.
In reactive sequences dynamics (A → B → C → D → E) “each event in the sequence is both a reaction to antecedent events and a cause of subsequent events” (Mahoney, 2000, p. 526). In other words, the first step on the path makes the final outcome very likely to happen, thus uncovering why the actors stay on that path. Bennett and Elman (2006) noted that the idea of reactive sequences resembles “stage theories” commonly used in development psychology, whereby individuals are passing stages of maturity in a set sequence. Unlike the deterministic quality of such stages, reactive sequences allow for several possible sequences and outcomes.

Case study methodology is believed to be particularly suitable for offering insights into a holistic and detailed analysis while simultaneously helping to elucidate the causal mechanisms within a particular context (Bennett & Elman, 2006; Steinberg, 2004). The art of telling a story under such conditions becomes essential as the teller takes a holistic view of the actual research situation and focuses on the causal relationships that link the different parts of the story.

**Process Tracing**

Process tracing is a technique of path dependency by which the complex chains of events are broken into smaller parts and/or pieces in order to identify the quality of relationships between outcomes and events that preceded them (Steinberg, 2004). Process tracing relies heavily on interviews, documents, and observations, all of which present certain challenges in terms of eliciting reliable information. To deal with inaccuracies when tracing causal pathways, Steinberg advised an iterative approach along two axes: lateral iteration between adjacent links in a casual chain and vertical iteration between macrostructural causes and the specific configurations of events they shape.

*Lateral iteration* presupposes making a difference between the activities and impacts of agents in order to uncover how the latter are driving the outcomes and the causal connections between them. *Vertical iteration* calls for understanding of “the larger “conditions of actions” (Mahoney & Snyder, 1999; Steinberg), “moving vertically” (Steinberg) and thus identifying broader dynamics of a macrostructure under study. This
vertical view enables the researcher to explore the impact of micro-structural changes on the macro-structural levels (Table 3.4).

The iterative design then requires the revision of and moving from lower levels of analysis to macroprocesses, where “the insights gained by upward movement will produce new questions that can only be answered by returning to micro-level analysis” (Steinberg, 2004, p. 13).

**Table 3.4. Lateral Iteration Versus Vertical Iteration (from Steinberg, 2004)**

<table>
<thead>
<tr>
<th>Lateral iteration</th>
<th>Vertical iteration</th>
</tr>
</thead>
<tbody>
<tr>
<td>(the horizontal axis)</td>
<td>(the vertical axis)</td>
</tr>
<tr>
<td>Causal relationships between dependent and independent variables</td>
<td>Larger, macro-cultural processes and forces shaping dependent variables</td>
</tr>
<tr>
<td>(Individual) conditions, actions (events) and their immediate outcomes</td>
<td>Impact of outcomes over time</td>
</tr>
<tr>
<td>Impact of actions (events) on the larger constellation of variables shaping the outcome</td>
<td>Dynamics and relationships of micro-cultural and macro-cultural processes</td>
</tr>
<tr>
<td>Participants as individuals and/or groups</td>
<td>Participants as members of a community of practice</td>
</tr>
</tbody>
</table>

**Analytical Procedures**

Analytical procedures used in this case study are represented by themes and information groups. Themes are associated with the patterns that emerged from the semi-structured interview data where the analytic lens rested on the lateral and vertical iteration perspectives. Information groups are defined as common causal relationships from other data sources (course, program and departmental documentation; student electronic portfolios; observations; participant feedback; and research journal)—these arose from the application of vertical iteration perspective and were supported by data from the semi-structured interviews (Table 3.5).
Table 3.5. Data Sources and Analytical Procedures

<table>
<thead>
<tr>
<th>Set of data sources</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semi-structured interviews</td>
<td>Lateral/vertical iteration</td>
</tr>
<tr>
<td></td>
<td>Identification of themes</td>
</tr>
<tr>
<td></td>
<td>Data from course, program and departmental documentation, etc. to support research claims</td>
</tr>
<tr>
<td>Course, program and departmental documentation</td>
<td>Vertical iteration</td>
</tr>
<tr>
<td>Electronic portfolios</td>
<td>Identification of information groups</td>
</tr>
<tr>
<td>Observations</td>
<td>Data from semi-structured interviews to support research claims</td>
</tr>
<tr>
<td>Research journal</td>
<td></td>
</tr>
</tbody>
</table>

**Themes**

Themes arose from the transcripts of semi-structured interviews with six participants (three faculty members and three students). As every transcript was read for depth and breadth, themes internal to each participant emerged. Each theme was elaborated with a set of codes that tapped into specific qualities of a theme. Tentative themes were applied to relevant sections throughout each transcript. When comparing transcripts for coding across participants, the similarities with which these participants approached the phenomenon of electronic portfolios were noted.

The identification of themes was guided by three research questions that prompted the author to seek evidence that could generate and support research claims. Lateral and vertical perspectives were used to analyze the protocol data, first in each participant and then across participants. Portfolio literature reviewed in Chapter 2 served as a way to articulate a claim that was grounded on the evidence represented by a particular theme.

**Information Groups**

Information groups are common causal relationships from other information sources (Table 3.5) that were supported by research claims generated from semi-structured interviews. The vertical iteration perspective was guiding the process of identification of information groups, where causal mechanisms (particularly, contingency and constraints)
were investigated as existing within the larger context of the departmental macrostructural shifts. As sets of causal conditions were identified, they were grouped into meaningful information groups. Information groups were then used to support the findings from the semi-structured interviews, similar to the way evidence from the semi-structured interviews was safeguarded against information groups.

**Satisfactory Explanation**

The above-described analytical procedures required the researcher to look into the plausibility of causal claims carefully. As advised by Steinberg (2004), a method of satisfactory explanation was applied. Satisfactory explanation was achieved as the author became intimately familiar with both the historical and current contexts of the department, which implemented electronic portfolios for a variety of purposes. Huntington (1991) suggested that a satisfactory explanation begins when the mind comes to rest. Steinberg considered the satisfaction of the mind of an individual researcher who, deeply immersed in the research situation, accumulates a great deal of understanding and thus generates plausible explanations and causal narratives.

The researcher of this case study was deeply engaged with the department for a number of years and developed strong connections with several faculty members, the continuous conversations with whom allowed the researcher to correct and judge the plausibility of research findings. After such prolonged engagement and persistent observation, the researcher encountered and heard the same things over and over again (Merriam & Associates, 2002), with no new information surfacing as more data were collected. Data began feeling saturated and the researcher’s mind was coming to rest.

**Participant Feedback**

It is very important to draw attention to the fact that in the course of this case study the researcher developed professional and personal relationships with all three faculty participants. All three were interesting interlocutors and attentive listeners who were very passionate about this research topic. They believed that this study would both benefit and educate the department about the potential of electronic portfolios. They always welcomed
informal discussions with the researcher and they encouraged the researcher to share her findings with them. Each of these faculty participants served as a sounding board for the researcher to test out her ideas. Each offered valuable feedback on numerous occasions.

Likewise, two student participants asked for the summary of research findings and offered their feedback to the researcher. The constant feedback flow between the researcher and study participants was a central feature of this research.

Triangulation of Data

Triangulation of data occurred throughout the research process. Triangulation is commonly referred to as a strategy of multiple methods of data collection and analysis (Merriam, 1998; Miles & Huberman, 1994), whereby multiple sources and modes of evidence serve as a way to verify findings. The researcher was highly cognizant of the significance of data triangulation for establishing causal pathways characterizing this research situation. Data collected from multiple entry points, including semi-structured interviews; course, program and departmental documentation; electronic portfolios; observations; and a research journal helped to trace multiple and meaningful causal relationships and thus iterate laterally (between dependent and independent variables) as well as vertically (through examination of larger forces and macrostructures).

The researcher also shared her data with two colleagues. The first colleague sat by researcher’s side as the coding occurred. The researcher commented on her thought process as she went about coding. Her colleague did not interrupt the researcher, but made written notes as the coding session progressed. At the end of the session, the colleague shared her feedback so that the researcher and her colleague could discuss the coding process.

The researcher shared her set of data with the second colleague, who used her own coding process to interpret the data. The researcher and her colleague then compared their codes; as a result, a combined set of codes emerged.

Ethical Considerations, Strengths, and Limitations of Research Design

Ethical considerations, strengths, and limitations of this research design are described to serve several purposes:
1. Such rich descriptions and openness give the readers a better understanding of the dynamics of the research situation;
2. They serve to calibrate and rationalize the research biases; and
3. These help to evaluate the merits of causal explanations for this study.

**Ethical Considerations**

Social research is always a complex and disorganized activity that requires the kind of interaction with research subjects whereby sensitivity to their perspectives and needs is of utmost significance. The researcher strictly adhered to confidentiality when collecting data and describing the findings of this study and obtained informed consent from all participants. The information that came from the subjects was handled with utmost care—it was coded without any reference to personal identifiers. All interview transcripts and other data will be destroyed once the write-up of this case is completed. The researcher deeply respects the perspectives of all participants and ensured that all of them received access to complete explanations of research methodologies and findings.

Alongside with careful consideration of subjects’ needs, the researcher felt the importance to be cognizant of the research questions and agenda and reporting the findings widely and objectively so that this work can be assessed by peers and judged in terms of its reliability (Freed-Taylor, 1994).

**Strengths of Research Design**

This case study focused on the explanation of causal pathways of the research situation whereby one department is implementing electronic portfolios to support learning, program assessment, and institutional accountability. The chosen research design presented a powerful way of providing causal assessment of a complex, multi-layered, and disorganized process of pedagogical and technological shift prompted by electronic portfolios.

Framing this research in terms of a case study allowed presenting a unique research situation in which the contradictions and complexities of real life were elucidated through rich and dense narratives of human actions and outcomes in all their diversity. This case study cuts across the many aspects of academic life and thus allows for readers of different backgrounds to make different interpretations and draw different conclusions (Flyvbjerg,
Most importantly, knowledge statements constructed here allow one to see some general tendencies that shape the basic contours of the electronic portfolio practice in one department.

**Limitations**

This study is limited to a particular instance of the implementation of electronic portfolios within the context of higher education. The Department of FSHN at ISU was chosen on the assumption that it represents the most mature use of electronic portfolios in the eDoc electronic portfolio system. Although such an assumption is valid, it also should be stated that this department did not have a long history of portfolio usage. On one hand, this fact can be interpreted as an advantage of this practical research whose focus was established on the evaluation of electronic portfolios to reconcile the multiple purposes of support for learning, program assessment, and institutional accountability and narrowed down to experiences occurring within the context of an electronic portfolio system. On the other hand, it could be argued that FSHN students and faculty had not yet developed a sophisticated understanding of the concept of electronic portfolios, which might have interfered with the way they interpreted their experiences.

Another limitation comes from the fact that the eDoc electronic portfolios system had been an academic enterprise in progress being designed and piloted by enthusiastic teams from the various departments and programs of this Midwestern university. The FSHN Department had undergone certain changes in portfolio interface, which inevitably frustrated student and faculty users. Such negative experience colored, to a degree, their experiences and learning.

The role of the participant researcher might have impacted the inward, immersive focus of this case study. The distance between the researcher and researched was shortened and intimate, allowing time and space for interactions that were not controlled and/or directed in the way semi-structured interviews would be organized.

The selective sampling in this case is another limitation. The faculty participants were the key pioneering figures in the departmental implementation of electronic portfolios for multiple purposes. All three were experienced teachers and/or administrators who had
established habitual ways of thinking about support of learning, program assessment, and institutional accountability. They had pre-established ideas of the kind of evidence they expected from student electronic portfolios to demonstrate program and institutional effectiveness.

Additionally, the instruments used to collect data for this study might have also been a limitation. Although every effort was made to ensure that the questions in the semi-structured interviews were articulated clearly, the faculty and students might have interpreted them in the light of their own understanding and/or learning and teaching experiences. Terminology and/or absence of it in student semi-structure interviews might have brought additional nuances to the way the questions were phrased.

Although there were limitations to this study, the research results provide a solid foundation for thinking about the practice of multiple electronic portfolio purposes and help.

In conclusion, this case study was designed to reveal multiple perspectives on the implementation of electronic portfolios for support of learning, program assessment, and institutional accountability in one academic department. The research design was guided by four factors: the researcher’s extensive involvement with the home-grown electronic portfolio initiative, research site and population, data availability, and the potential to gain insights into the complexity of this research situation. Data were collected from multiple entry points and analyzed using path dependency and process tracing. The methods addressed in this chapter support the research claims made in the following chapter.
CHAPTER 4: RESULTS

In accordance with the analytical procedures described earlier, this chapter is structured to present evidence supporting the lateral and vertical iteration perspectives on multiple purposes of ePortfolios in one department. This chapter consists of three parts.

The first part introduces the student and faculty/staff research participants and tells their stories of engagement with ePortfolios.

In the second part, the themes that emerged from the protocol data are organized into two research claims examining (a) student and faculty differences in conceptualizing the multiple purposes of ePortfolios and (b) student and faculty differences in understanding ePortfolio purposes. Each claim is described to bring forth the lateral iteration perspective with a focus on each of the participants as an individual as well as their actions, outcomes, and causal relationships.

In the third part, vertical iteration is furnished through larger organizational processes shaping ePortfolio development in the department. The researcher describes causal relationships within the larger context of departmental macrostructural shifts with a focus on the key actions and outcomes of the three faculty participants to implement ePortfolios for multiple purposes.

All three parts speak to the major research outcome of this work, which can be stated in the following way:

1. Multiple purposes of ePortfolios created a tension in this department that was triggered by perceptual differences and differences in understanding the purposes for portfolio development by students and faculty (addressed in the second part of this chapter);

2. This tension was recognized and approached through (a) entrepreneurial activities of those faculty members who were enthusiastic about ePortfolios, (b) leveraging grass root movement and administrative support for ePortfolios (addressed in the third part of this chapter).

Research Participants

The participants, whose voices are presented below, were selected to tell the story of multiple purposes of ePortfolios in one department from different perspectives. The input that
came from three students and three faculty/staff members is central to this case study. Each participant had a unique vision and experiences that shaped their perceptions and understandings of portfolio purposes.

**Faculty Participants**

**Committee Member/Adviser.** Committee Member/Adviser was an early adopter of ePortfolios in the department. She explained that she had used paper-based portfolios in her teaching for a number of years before embracing ePortfolios.

> I actually used portfolios for quite a few years. The year I started as the instructor, I implemented them for the first time. I thought it went fabulous, because . . . well, first of all, they were all in a binder, the ring binder, and I thought students could much easier see these were the expectations and it was a method for them to start collecting examples of their work. It also created a structure for them to build on as they moved through the program. So, I really liked the portfolio concept, even though hardly anybody was using portfolios in the FSHN Department. (Committee Member/Adviser, Feb. 22, 2006)

Joining the eDoc ePortfolio project at its very inception, Committee Member/Advisor was highly motivated to participate in the design and development of the custom-tailored FSHN eDoc ePortfolio template that she hoped to be making extensive use of in her teaching. She clearly saw the benefits of paper-based portfolios, but did not like the piles of student binders that inevitably cluttered her office each semester. The electronic format offered portability and easy access to student work.

> With hard copies, the one downside was that I was carrying around a box of portfolios across campus that my students would turn it for me to evaluate. As I would meet [students] for individual appointments to pick up their portfolios with my comments, there would be piles of the ring binders all around us. So, what I instantly loved about electronic [portfolios] is that I am not carrying boxes across campus. (Committee Member/Adviser, Feb. 22, 2006)

After the successful pilot of the eDoc FSHN ePortfolio template in her 2004 FSHN 110 Orientation Seminar, Committee Member/Adviser shared her excitement for ePortfolio development with her colleagues and the Outcomes Assessment Committee, on which she served as a representative of the dietetics faculty. She also began educating herself on the potential of ePortfolios to support learning and teaching by reading educational literature and attending professional conferences as well as networking with other FSHN instructors.
interested in the ePortfolios. She shared her own portfolio experiences and dilemmas through her conference presentation entitled “Assessment Strategies that Work: Student Portfolios” that she prepared for the Assessment Symposium, Institute of Food Technologists Food Expo and Annual Meeting, Las Vegas, NV in 2005 (from the researcher’s journal).

Having extensive knowledge of outcomes assessment policies from both the FSHN Department and dietetics program, she became a very active proponent of coordinating college, department, and program-specific learning outcomes in order to bring consistent messages about ePortfolios to undergraduate students.

The customized [FSHN eDoc] ePortfolio template that we devised for our students makes them be aware of the outcomes of their learning. Having those outcomes for students to see—this is an expectation that is very transparent to students about what they are to achieve and about us, as a department, to make their courses more meaningful, because they can see how everything connects together. (Committee Member/Adviser, Feb. 22, 2006)

As an academic adviser, this faculty member thought about the value of ePortfolios as expanding beyond mere outcomes assessment purposes.

As an advisor for the students, I think it is valuable for them to start thinking about career goals and identifying what they can keep as an artifact to showcase their learning for future employers. (Committee Member/Adviser, Feb. 22, 2006)

Thus, Committee Member/Advisor was particularly keen on the potential of ePortfolios to (a) guide student learning through consistent outcomes assessment policies and (b) provide meaningful academic advisement.

ePortfolio development was a critical element of FSHN 110 Orientation Seminar, the course she taught annually. The objectives of this course revolved around familiarizing students with academic, personal, and career resources and implication, for student life at ISU. One of the learning outcomes Committee Member/Adviser intended to achieve in this course was to help FSHN students generate a long-term plan of studies and begin developing a portfolio that reflected their educational and career goals. In Fall of 2006, Committee Member/Advisor mandated the use of the eDoc FSHN ePortfolio template in this course. Specific portfolio activities for students included:

- managing the introduction section and describing their portfolio goals;
- developing a resume and connecting it to the Introduction section;
• creating an interview assignment to be linked to the communication ability area together with an accompanying reflection;

• uploading and connecting optional artifacts to any other portfolio area.

Because the seminar was designed to particularly address the communication outcome, each student was required to write a paper about his/her experience of interviewing a practicing dietitian professional. Committee Member/Advisor developed this assignment to help her students learn about their future job responsibilities and importance of communication within the professions of food science, human nutrition, and related areas. Additionally, she requested that students write two reflective pieces: one to accompany and reflect on the suggested interview paper and the other for students to self-evaluate their progress in communication. The students were then asked to peer-review each other’s portfolio artifacts before submitting them to Committee Member/Adviser for assessment.

To make her students aware of what shape portfolio practice could take, this faculty member devised her own ePortfolio using the FSHN eDoc ePortfolio template. She also made different resources, including books on portfolio ideas and eDoc Help handouts, available to her students during this course. Committee Member/Advisor represents an example of an early adopter who opted to make an individual decision to use ePortfolios in her classroom.

Program Director. The Dietetics Internship Program Director (referred to in this text as “Program Director”) had made use of paper-based portfolios in her sophomore and senior level classes and became very enthusiastic about benefits of the electronic format.

The paper-based portfolios reminded us of why we needed to go electronic—because paper-based really could be very, very cumbersome and very unwieldy. So, we found that even when we had students using paper-based portfolios, even for one school year, they and us, instructors, had the potential to have this huge conglomeration of stuff. (Program Director, Feb. 22, 2006)

Like Committee Member/Adviser, Program Director was concerned with providing academic and career development advisement to her students. She considered ePortfolios to be a helpful tool for mentoring and planning.

In her course, FSHN 203 “Contemporary Issues in Food Science and Human Nutrition,” Program Director asked her students to write a paper and prepare a presentation
on a course-relevant topic of interest, both of which ought to be included in their eDoc ePortfolios. These artifacts represented evidence of student attainment of the Social Concerns/Ethics outcome, which this course particularly addressed. Program Director urged students to peer review their portfolio artifacts before submitting them for final evaluation. In addition, all students in this class were instructed to revisit the introduction section of their portfolios and update it with their current understanding of the dietetics profession and to thus build upon their portfolio work from FSHN110 Orientation Seminar.

Program Director, an active eDoc participant who attended all project meetings, actively contributed to the design and development of the FSHN customized portfolio template. Persistent about further improvement of the eDoc FSHN portfolio theme, she won an eDoc mini grant, hired undergraduate students to suggest ways in which the portfolio design could be improved, and created eDoc department-specific Help reference lists. Program Director was in favor of promoting the creation of a representative collection of FSHN exemplary student portfolios for program assessment.

This faculty member had a program-wide influence. She actively voiced her opinions about the benefits of portfolio practices and had numerous informal conversations with her colleagues on portfolio topics (from the researcher’s field notes). Program Director represented an individual example of the innovation decision with authority to recommend that other faculty members infuse portfolio development in their classes. She believed in building consensus in the Dietetics Program with regard to ePortfolios. Displaying innovative behavior by employing ePortfolios in her classes, she set a powerful example for the rest of the dietetics faculty.

**Associate Department Chair.** The third faculty member who participated in this case study was the Associate Department Chair, who was also a member of the Outcomes Assessment Committee. Although she stood up for the potential of ePortfolios to support multiple purposes, she was cautious to force the ePortfolio innovation on the FSHN faculty (from the researcher’s journal). Empowered to make authoritative decisions, she was concerned with how the FSHN Department should proceed with the infusion process. She was well aware of the enthusiasm of the dietetics faculty and was eager to educate herself on
the benefits of ePortfolio development. Familiar with the FSHN custom-built ePortfolio template and knowledgeable about the eDoc initiative, the Associate Department Chair was, however, cautious to take into account the many issues that might possibly arise from an organizational decision to adopt ePortfolios. Being part of the system culture and an opinion leader, she displayed prudent judgment about ePortfolios and had to consider the position of the department with regard to the ePortfolio adoption (from the researcher’s journal).

The prudence of Associate Department Chair was illustrated in several instances. On one hand, she authorized the use of departmental resources to hire an ePortfolio assistant whose duties comprised assisting faculty and students with the technical aspects of the eDoc portfolio software. In cooperation with the portfolio assistant, Associate Department Chair won a grant from the Computation Advisory Committee to purchase digital video cameras and computers for FSHN undergraduate students to produce multimedia artifacts for inclusion in their ePortfolios. On the other hand, Associate Department Chair did not use the eDoc FSHN ePortfolio in her classes though she was planning to do so at the time of this research (from the researcher’s journal).

Associate Department Chair was very adamant about restructuring the FSHN curriculum in which ePortfolios would allow the faculty members and administrators to move beyond what was happening in their individual courses. She saw the value of ePortfolios in helping both students and faculty members to make sense of the curriculum. As she explained,

Our task . . . is to help faculty members examine how we as a department foster student learning. We need to move away from the “What happens in my course” to “Let’s see when and where we introduce new skills and content knowledge to students.” Are we making sure to cover all necessary topics? Do we duplicate them? In what courses? Why does it happen? Attending to our own courses and not the whole system, we are not helping our students to make sense of the curriculum. (Associate Department Chair, Feb. 21, 2006)

Associate Department Chair stood beyond the entrepreneurial activities of those faculty members who were enthusiastic about the ePortfolio development and was acutely aware of the necessity of leveraging grassroots and administrative support for this practice in the department. This, she understood, required the development of a teaching and learning philosophy that would build on the department’s social capital.
As a department we need to create a philosophy, understanding of ePortfolio development among our faculty. And we as a committee said the structure is what helps. As a department we should be consistent with what we are telling students. So, we’ve been talking to faculty, debating, and need to say this is a portfolio where we need our students to show they’ve met specific outcomes and can do that through an artifact. Since we are very new to incorporating ePortfolios, as a department we need to decide and clearly communicate that. (Associate Department Chair, Feb. 21, 2006)

In summary, these three faculty members, Committee Member/Advisor, Program Director and Associate Department Chair, were the key faculty figures in this case study. The second part of this chapter will elaborate further on the above-mentioned statements.

Student Participants

The three undergraduate student participants in this study composed their ePortfolios in order to comply with the requirements of the mandatory courses they took, thus implementing the decision made by the authority—their course instructors.

Gregory. Gregory, a freshman, enrolled in the dietetics program in the Fall semester of 2005 and had recently joined the FSHN Learning Community. He created his ePortfolio as part of the FSHN 101 Orientation Seminar requirements, in accordance with which he posted overall comments on his portfolio in the introduction section (Figure 4.1). In his posting he

![Personal Portfolios](figure.png)

Figure 4.1. Gregory’s introduction (captured on 3/17/06).
was explicit about the purpose of his portfolio—to demonstrate and reflect on his professional abilities as dietetics major. He was planning to become a nutritional expert counselor for a cycling team and work with and for sports professionals. He also linked his resume to the introduction section as instructed in the Orientation Seminar.

As part of the seminar requirement, Gregory added the interview artifact, in which he documented his conversation with a dietetics professional about the nature of her work. He linked the artifact to the communication area as directed by the instructor and reflected on both his communication ability and the interview artifact.

However, he felt that these pieces of work did not fully capture his abilities and made an optional decision to include two supplemental artifacts, created outside the classroom environment, that described his skills and experiences as an Eagle Scout leader. Each supplemental artifact was accompanied by an optional reflection. He utilized the Add Ability feature of his ePortfolio to create a Leadership Ability area in addition to the Communication, Problem-Solving, Social Concerns/Ethics and Technical Skills area, specified by the department.

After he successfully completed the seminar, Gregory continued with his portfolio, even though it was not used in any other classes that he took after the Orientation Seminar. For instance, he added an analysis paper on American photography arts, a paper and presentation on carbohydrate loading research, and a paper on biotechnology and foods. Each of these artifacts was supplemented with reflections. Although the artifacts came from Gregory’s freshman courses that followed the Orientation Seminar, he made an effort to write optional reflections regarding them (Figure 4.2). Gregory created his portfolio as part of an academic requirement, but in the process he grew genuinely interested and continued updating the portfolio, even though it was not required for other FSHN classes he had taken by the time of this research.
Figure 4.2. Gregory’s Overview (captured on 3/17/06).
In the overview table there are three columns, of which the first represents the ability area, the second contains the title and link to the corresponding artifact, and the third displays an icon symbolizing that the artifact is accompanied by a reflection.

Sarah. Unlike Gregory, Sarah developed her portfolio during three classes. Following the seminar requirements, she completed the introductory page of her portfolio, where she focused on her goals to design and follow a plan of academic activities that could help her better understand the core of the profession and prepare for becoming a registered dietitian (Figure 4.3). To comply with the Orientation Seminar requirements, Sarah linked the resume to her introductory page and included the mandatory Interview artifact and an accompanying reflection.

Because she was required to maintain her ePortfolio for her next course, FSHN 203 “Contemporary Issues in Food Science and Human Nutrition,” she included a mandatory reflection in the Social Concerns/Ethics section of her portfolio, where she discussed the ethical aspects of the dietetics profession. She did not, however, include in her portfolio a mandatory FSHN 203 artifact, a paper or presentation on a course-relevant topic of student interest,. She wrote a paper and designed a presentation, but misinterpreted the class requirements and did not include these in her portfolio.
Sarah revisited her portfolio during the FSHN 340 “Orientation to Dietetics” class, in which she was introduced to the roles of dietitians in multidisciplinary, varied settings. FSHN 340 was extensively focused on two aspects: the preparation of students for the dietetics internship and the discussions of professional ethics, health care delivery systems, and lifelong professional growth and development. The role of ePortfolio development for this class was to prompt students to begin the process of “proof learning” as professionals. Sarah was expected to:

1. Update the introduction section of her portfolio with a reflection on her progress as a learner and professional in the dietetics field;
2. Update her resume;
3. Create, upload, and link an internship application and application cover letter to the introduction section;
4. Possibly include information showing her involvement in campus or her local community.

Accordingly, Sarah updated her resume and placed her internship application and cover letter in the introductory section of her ePortfolio.

At the time of this research Sarah’s portfolio contained required artifacts only as shown in the screen shot of her portfolio overview page shown in Figure 4.4.
Sarah’s involvement in portfolio practice was a direct influence of the authoritative directions she received from her instructor. She complied with the course requirements, but did not feel enthusiastic about the process of portfolio development.

Megan. Like Sarah, Megan developed her ePortfolio in three classes: FSHN 101, FSHN 203, and FSHN 340. Her introduction section contained a reflection and resume (see Figure 4.6) that she first created in the FSHN 101 Orientation Seminar and then updated in FSHN 340. In her updated introductory reflection, she narrated her intention to become a dietetics professional to meet the nutritional needs of girls and women with eating disorders. She then outlined her academic goals and presented the purpose of her portfolio as documenting her learning.

Megan also complied with the FSHN 340 course requirements as she composed her internship application and cover letter and posted them on the introduction page. In Figure 4.5, links to the Program of Study and Program of Study (supplemental) contained the above-mentioned documents.
To fulfill the requirement of the FSHN 101 Orientation Seminar, Megan included her interview paper in the Communication section under Core Abilities and wrote two reflections, the first of which was an overall reflection on her ability to communicate and the other, a reflection on the interview paper. However, upon completion of the seminar, she decided to replace the interview paper with what she thought was a more mature piece of work, the FSHN 203 paper on folic acid supplements. She believed that the FSHN 203 paper was demonstrative of her as a future dietetics professional concerned with the issues of child birth defects (Megan, Feb. 16, 2006). In Megan’s opinion her FSHN 101 paper was a weaker piece of work than her article on folic acid. Additionally, she felt she was better able to better showcase her communication abilities by including a PowerPoint presentation on folic acid that she presented to her class. Megan noted in her accompanying reflection that these artifacts were representative of her ability to prepare and deliver effective presentations of technical information to food science and nutritional specialists. These artifacts were required FSHN 203 assignments.

Additionally, this senior student included a paper that she completed on genetically modified foods and linked it to the Social Concerns/Ethics ability area. This was another assignment created for FSHN 203, but not required for portfolio inclusion. Megan then wrote
a reflection on how her attitudes towards genetically modified foods changed as she conducted research on the issue. This student did not use the Add Ability feature (Figure 4.6).

Like the other two students, Megan created her portfolio under the pressure of course requirements. However, in the process she made a decision to substitute some artifacts for others because she felt her portfolio needed to represent her as a mature dietetics student.

Perceptual Differences and Differences in Understanding ePortfolio Purposes

The research outcome that “multiple purposes of ePortfolios in the department created a tension that was triggered by perceptual differences in students, faculty members and administrators” is endorsed by two claims:

1. Undergraduate students, faculty and administrators in this department conceptualized ePortfolios differently.

2. Undergraduate students, faculty and administrators in this department had different understandings of ePortfolio purposes.

Research Claim 1: Undergraduate Students, Faculty, and Administrators in this Department Conceptualized (Perceived) ePortfolios Differently

The undergraduate students in this case study perceived ePortfolios to be convenient electronic containers, extensive resumes, course assignments, employment tools, but rarely learning tools. Contrary to these perceptions, the faculty participants defined ePortfolios as
learning tools, assessment tools, and employment tools (Table 4.1). Details of the students’
perceptions, followed by the faculty perceptions, are presented next.

**Student Perceptions of ePortfolios**

*Electronic Container.* When asked to identify the advantages of their ePortfolios, the
students in this case study formulated diverse responses. Most frequently, a portfolio was
perceived as an electronic container for generated collections of student work, a convenient
way of storing electronic files in one allocated space accessible online. Easy transportability
and large storage space were perceived as obvious advantages to the heavy weight and
limited space of a traditional three-ring binder.

I never knew about online portfolios [before]. I just thought everything was in a black
book and you carry that . . . and when we started working on this project [the
ePortfolio], I loved the idea of being able to bring my little ZIP drive with me and just
put everything online, so it was on a computer where a lot of other people could
access it, eventually. And I can keep working on it, instead of printing off tons of
paper copies that I just have to add eventually anyways. So this has been really nice,
just to be able to insert staff when I think of it. (Sarah, Feb. 15, 2006)

[ePortfolio] is for me to be able to store my files all in one place and access them
from any computer. (Megan, Feb. 16, 2006)

Emphasizing the capacity of their ePortfolios to store many artifacts, these students
indicated that the decision to upload work samples to the portfolio environment largely rested
on two factors: the mandate coming from course instructors who pointed out course-specific

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**Table 4.1. Student Versus Faculty Perceptions of ePortfolios: Frequency Count**

<table>
<thead>
<tr>
<th>Perception</th>
<th>Students</th>
<th>Faculty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolios as eContainers</td>
<td>18</td>
<td>1</td>
</tr>
<tr>
<td>Extensive resumes</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Course assignments</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Employment tools</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Learning tools</td>
<td>8</td>
<td>28</td>
</tr>
<tr>
<td>Assessment tools</td>
<td>4</td>
<td>25</td>
</tr>
</tbody>
</table>
products of student learning as necessary for inclusion (Gregory, Sarah, Megan) and the intuitive feeling of these portfolio owners who believed that certain artifacts could be potentially used in the future (Gregory, Megan).

The portfolio collections tended to begin with mandated course-related artifacts that showcased student attainment of course goals and objectives and received positive assessment from course instructors. Positive assessment from instructors, who were treated as authoritative figures, was perceived as giving weight to and validating the importance of included artifacts. Mandated course-work artifacts also gave the portfolio authors a sense of what kind of examples could be considered for collecting and storing in their portfolios. All three students indicated a strong preference for receiving specific instructions regarding the nature of artifacts to be collected and included:

I wish [instructors would] specify [artifacts] more and say, “This would be great for your portfolio. This is what can help build up your portfolio.” I am OK with that. (Sarah, Feb. 15, 2006)

I was initially unaware that these portfolios existed, so it was helpful to have it assigned to put it in there to get an idea of things that would go. . . . (Megan, Feb. 26, 2006)

Gregory explained that the ePortfolio development process took a long time to figure out, so starting his collection with required artifacts gave the time, direction, and room for improvising and helped him begin developing the intuition for which work samples could be potentially considered for inclusion (Gregory, Feb. 13, 2006).

Intuitively, the portfolio authors felt that the products of their learning experiences that occurred outside of class settings could add to the individuality of their collections, although only one of them placed such an artifact in his portfolio. This portfolio owner believed that his participation in and leadership of a community service project was a unique learning experience that, though occurred out of the classroom environment, was also valuable in the academe (Gregory’s portfolio reflection; Gregory, Feb. 13, 2006). The two other student participants emphasized the academic character of their artifacts and preferred to collect pieces of work illustrative of skills, competencies, and knowledge marketable in their fields of studies.
In accordance with the preference for marketable artifacts, all three participants emphasized that their collections should contain best, polished samples of their work. In fact, these portfolio authors believed that their collections needed to be updated and cleared of old pieces as soon as more advanced artifacts were produced. One participant explained:

[When] I did a little project for my career studies last semester, I thought it that was the most in depth. Wow! I can actually talk to a professional! Now I am actually assessing people’s diets and I am recommending what they should be eating. . . . I am definitely going to erase the old stuff from fall because no one cares about it. (Megan, Feb. 16, 2006)

When asked to rationalize the inclusion of the best artifacts in her portfolio collection, Megan spoke eloquently:

I think the portfolio should probably reflect your best work because if you’re going to be showing it to other people then I think it should reflect your best efforts. And if you’re going to just fluff the papers together and put them on there, I don’t think that’s really fair to yourself and to others because what if someone looks at it and it’s not showing your best work? So I guess if you’re going to put it in then I’d just be sure you’re going to make changes to it because it should probably be some of your better work if it’s in a portfolio because I see a portfolio as showing your professional work. And if you want your best work in it then I think it should have not just papers that you don’t really care about, but like include things that you’re passionate about. . . . These papers should be well done though. (Megan, Feb. 16, 2006)

The advantage of the portfolio as an electronic container was equated by Megan to a magic box whose depth is filled with polished academic-quality artifacts that could be promptly taken out and easily organized to showcase and market the portfolio owner’s skills and abilities. Thus the advantage of the ePortfolio was reduced to large storage capability, easy access, convenient transportability, and an easy way to display desired artifacts.

*Extensive Resume.* The capacity of the ePortfolio to contain a significant number of student work samples was likened by two students to an extensive resume that encompassed every bit of information about student achievements and activities and helped to remember the chronological order of such events. One participant explained that every time I go to interview for an on-campus club or something like that, I am constantly adding that club up to my resume and then I print it off to go when I apply for jobs and stuff and that’s just getting to be a hassle. And sometimes I forget what I’ve been involved in, like the little things that you do not add to a resume because they are not that important, but it is nice to keep them somewhere. So, they were on a
piece of loose-leaf paper behind my computer, which is not a very good place for
them to be. Now I might keep them in my portfolio, so that I don’t have to keep
writing down on a piece of paper. (Sarah, Feb. 15, 2006)

Megan defined her portfolio as

a place . . . to document things that I’ve been gone through throughout my college
career and update them and make them available to look at and see what I’ve done as
kind of working and building something a little bit broader than a resume. (Megan,
Feb. 16, 2006)

Gregory also supported the idea of the portfolio as a resume by indicating that an ePortfolio is
“to highlight the things you’ve done and just experiences you have . . . like a resume but
better” (Gregory, Feb. 13, 2006).

Much like the electronic container, the portfolio as an extensive resume was
conceptualized as a way to keep, organize, showcase, and distribute student work samples
and to help the portfolio authors to keep track of where they had been and what they had
done. But unlike a resume—a mere list of student experiences narrated in chronological
order—the portfolio offered tangible evidence of student excellence in the form of easily
accessible artifacts, thus transforming the electronic container into an extensive resume in
which each experience was directly connected to a product of student learning that had the
potential to interest various audiences.

The perceived advantage of the portfolio as an extensive resume was also viewed as
helping to measure whether portfolio authors accumulated a satisfying amount of material
evidencing their academic achievement. Thus the portfolio was perceived as a tool for
stimulating career planning. Sarah remarked:

I don’t think [my portfolio] is not useful yet, but I think later on, I can look back and
say, “Well, I haven’t really done a lot. Maybe I should do a little bit more. Do some
more projects.” I mean, if this is part of my resume. (Sarah, Feb. 15, 2006)

The portfolio was expected to boast numerous high quality pieces to suggest the owner’s
strong grasp of skills and competencies valued in her professional field and strengthen the
effect of her traditional resume.

Employment Tool. Perceived as an extensive resume incorporating a range of products
of student learning, the essence of the portfolio was immediately linked to an employment
tool. All three participating students were quick to mention the potential use of their portfolio for job searching. A typical definition of the portfolio as an employment tool included: “giving employers an idea of my interests and strengths through my presented pieces of work” (Gregory Feb. 13, 2006). Sarah said that her ePortfolio gave her a step ahead to begin thinking about what she could offer to a future employer (Sarah, Feb. 15, 2006). Megan strongly insisted, “[My portfolio] is solely for a job opportunity” (Megan, Feb. 16, 2006) and refused to suggest further ideas about the purposes of her ePortfolio. All three students agreed that they would include the best artifacts in their employment portfolios to make a favorable impression on future employers.

Unlike the rest of the students who agreed on the potential of employment portfolios to ease the process of looking for a job, Sarah described having mixed feelings. She questioned whether keeping this portfolio updated and edited is truly that much more beneficial than going to the career fair, talking to people, handing out your resume, applying for things. . . . I haven’t seen myself truly how much more beneficial it is. I mean I’ve seen the points and why it is good, but I can’t say I understand anything that took it over the top. (Sarah, Feb. 15, 2006)

Perceiving her employment portfolio as “something broader that a resume,” Sarah constantly referred to it as an intermittent vehicle for testing her chances in her job search in the sense that she intended to keep up her portfolio on the chance it would prove effective in applying for an internship and occasional summer jobs. If the portfolio failed to assist her in finding an assistantship or summer job, she was confident she would not use it as an employment tool in the future.

Sarah, like the other two students, was not conscious of the possibility of creating multiple employment portfolios for different employers. She created a portfolio as a course requirement and believed that by updating one universal portfolio she would satisfy the needs of different employers. She was not aware of the possibility of creating multiple employment portfolios that could be organized around different context-sensitive contents targeted at different audiences. In fact, none of the student participants was aware that the eDoc software allowed the creation of many portfolios, all sharing the same file repository but each
presenting a different combination of artifacts and reflections depending on the needs of different audiences.

The ePortfolio as an employment tool was also viewed as taking much upkeep time and effort. During interviews all participants felt that their then-current portfolios would not give future employers a good picture of their knowledge, skills, and competencies. Gregory, who was just recently exposed to ePortfolio development, and Sarah and Megan, who engaged in it for two semesters, believed that their portfolios lacked a sufficient number of quality artifacts. These students expected to produce the best pieces for inclusion in advanced dietetics classes towards the end of their undergraduate careers. Because of such an assumption, the development of a “real” employment portfolio was postponed until the “right” time, as illustrated by this response: “I am sure I am not going to change too much my portfolio until probably late in my junior or senior year when it’s actually interview time [for job opportunities]” (Sarah, Feb. 16, 2006).

The expectation that the best, appropriate for job-search artifacts would be compiled towards the end of their undergraduate careers was coupled with a concern for having an insufficient number of samples created out of class. Acknowledging that course-mandated artifacts would provide a good start to their employment portfolios, Gregory and Megan worried that future employers might be interested in examples that went beyond the scope of college classes. Gregory stressed the importance of getting involved in on-campus extracurricular activities to help future employers with “kind of seeing a pattern, maybe of what I’m interested in and where it’s going to be leading me” (Gregory, Feb. 13, 2006). He felt that course-related portfolio contents should be accompanied by out-of-class learning experiences. In spite of the same concern expressed by Megan, only Gregory considered bringing an artifact into his portfolio that was not directly related to in-class learning. He felt that the inclusion of such an aspect in his portfolio would inevitably impress potential employers.

Sarah believed in the importance of receiving more specific directions from course instructors as to the nature of artifact appropriate for inclusion in her employment portfolio.

I think [the portfolio] is solely for a job opportunity. That how I guess I view it, but it’s helpful if [instructors] tell you this would be a good thing to put in your portfolio,
or something because sometimes you are not really sure. Like if you do a paper, is it helpful or is it not, what would an employer look for? So, I mean, it helps, I mean if they could tell us that information. (Sarah, Feb. 15, 2006)

The conception of the ePortfolio as an employment tool verbalized by these students involved a dilemma: on one hand, the portfolio was described to be more inclusive and representative of student knowledge, skills, and experiences than a resume and thus more appealing to future employers; on the other hand, the portfolio was presented as more mystifying and requiring more up-keep efforts than a resume.

Course Assignment. The concept of the ePortfolio as a course assignment dominated student conversations; all three students brought up this aspect during interviews in response to the suggestion to describe the purposes of their portfolios. The task of portfolio development was perceived as a course requirement that needed to be completed in order to receive a passing grade. The typical explanation for such a portfolio concept revolved around successful student attainment of course goals and objectives and involved referring to the ePortfolio as an assessment method.

Gregory saw his portfolio as a means of proving to his instructor that he was capable of creating artifacts that would meet or exceed learning outcomes defined by the course and/or department (Gregory, Feb. 13, 2006). Sarah explained that she initially viewed her portfolio as improving her employment chances but being restricted to mandated course-specific artifacts and predetermined portfolio structure organized around learning outcomes changed her understanding of the portfolio as an employment tool to the portfolio as a course assignment (Sarah, Feb 15, 2006). She felt that artifacts not directly related to her in-class learning were not welcome in her portfolio, the only function of which she viewed as documenting and showcasing her performance in class. Such a perception of the ePortfolio was disputed by Gregory, who also referred to his portfolio as a course assignment but, in addition, felt that a variety of artifacts including those not directly linked to his in-class learning were encouraged (Gregory, Feb. 13, 2006). Gregory, however, was the only portfolio owner who made a decision to include a number of artifacts that were not produced as a result of coursework. Both Sarah and Megan articulated the assumption that overloading their
portfolios with “extra” artifacts (those that were not outlined in course syllabi) was not helpful to the course instructor to assess student progress in class.

I picked this [artifact] because I think this was just what [the instructor] wanted us to have, so I did not really decide. This was the one [artifact] I was told to have in it. It is easier for her to grade, because everyone has the same artifact. I do not know how she would have graded all different things in here. (Sarah, Feb. 15, 2006)

The reflective pieces accompanying the course-specific artifacts were also referred to by Sarah as course assignments and were considered of lesser importance than the artifacts themselves.

I had to write [reflections] because it was required for the course. I don’t think I would have done them otherwise. Though it is nice to have them, you can kind of say something rather than having a bunch of pieces of work in [the portfolio]. (Sarah, Feb. 15, 2006)

When asked what the reflections added to her portfolio, Sarah said that they were written to give a basic idea to portfolio readers about the artifact that followed it.

The reflection is short and pretty much says why I put this artifact in. It said that the artifact was a required assignment for the course. The assignment was to interview a professional and to learn communications skills required for this job. The reflection was just another part of the class that I threw in. (Sarah, Feb. 15, 2006)

Being just another course assignment, the reflective pieces were seen as a summary of the artifacts. The same student remarked that focusing on what she had taken away from that artifact and its place in a mosaic of her learning experiences would have made the reflection better, but she did not feel it was what she was asked to do in class. “This specifically was done as an assignment; the reasons for doing it were straightforward and established by someone other than me. So, I just followed the assignment guidelines.” (Sarah, Feb. 13, 2006)

The portfolio as a course assignment was also associated with a period of time limited to the duration of the course that required portfolio compilation. All three students remarked that, though portfolio development was given special emphasis at the beginning of a particular course, it did not receive much explanation and clarification further in the course. At the end of the semester (and course) the students were then faced with the necessity of hastily submitting a finished portfolio to receive a grade. Because the students did not
systematically update their portfolios during the course, Sarah and Megan had to engage in last-minute writing to meet the deadlines. Megan commented:

All of this needs to be edited, but because it was done so late last semester, it was to the point where I was like “Okay, let’s just get this done. I will write this down and then, you know, can come back to it,” and obviously I have not come back to it. (Megan, Feb. 16, 2006)

Once submitted and graded, the course-required portfolios of Sarah and Megan remained dormant because they were viewed by these students as a successfully fulfilled course requirement that had no continuation or connection to other courses.

To summarize, the concept of the ePortfolio as a course requirement was perceived as helping the students contribute to the collection of artifacts that could be utilized in the future to showcase their knowledge, skills, and abilities. However, the contents of the portfolio as a course requirement tended to remain unedited in spite of the opinions of these portfolio authors that the course-specific artifacts and reflections needed to be updated in the future to suit employment-seeking purposes. In other words, the students did not review such artifacts and reflections because the end of the course signified no need for urgency.

Learning Tool. The ePortfolio as a learning tool was not particularly favored by these student participants. In their opinions, ePortfolio development was, first and foremost, attached to the products of their learning, not processes, and as such culminated in the production of tangible evidence of their performance (artifacts) that was contained within portfolios, which they conceptualized as electronic containers, extensive resumes, employment tools, and course assignments. Thus, the value of portfolio development was viewed as collecting, storing, organizing, and distributing student work samples to interested parties rather than facilitating and enhancing student learning and growth.

In fact, growth was associated with having plenty of room for improvement, whereas these student participants believed that the portfolio concept should suggest excellence, not just mere progress towards it. For example, Megan reflected during the interview that she did not see any place in her portfolio for old, immature artifacts created earlier in her undergraduate career, because they did not present any interest to either her future employers or instructors of advanced classes.
If this portfolio is just for me, I mean it would be fun to go back. Ok, I could see “Oh, I was just a member of that group and now look at what position I am at. Cool, I’ve advanced,” or “Wow! My writing was kind of juvenile back then and now I understand a little bit more. I can relate more to it.” So, that would be kind of fun just because it’s encouraging, but if that was the only reason for using my portfolio I don’t think it’s worth it. (Megan, Feb. 16, 2006)

Sarah also acknowledged that she did not see the benefit of using the ePortfolio as a learning tool to track personal growth.

I would not use [the portfolio] for personal growth-wise reasons. I would put things in there that would show that I have grown for other people I guess if they were looking for that, which I do not think they ever will. They just want to see my personal best is what I think. But if theoretically saying learning was the only reason, it’s not probably something I’d just keep track of, just because on a personal level. (Sarah, Feb. 15, 2006)

Gregory supported this viewpoint, and agreed that if there was no practical reason behind portfolio development, which he articulated as increasing his employment opportunities and/or demonstrating performance and attainment of course goals and objectives, he would be less likely to proceed with his portfolios.

Though this idea was dominant, it was refuted by Megan, who contradicted her previous statement (above) that she did not think the portfolio was a worthy learning tool.

I can sit down and organize my ideas [in the portfolio] and be honest with others and myself—this is where I am good and this is what I need to improve. I hope this portfolio will help me to do some reflections that show people that I might have weak points, but I see them too and try to make myself better. (Megan, Feb. 16, 2006)

This student put particular emphasis on her reflective pieces, explaining that the artifacts might not necessarily be of highest quality, but the accompanying reflections coherently rationalized why such artifacts were considered for inclusion and how the awareness of their vulnerability could help this portfolio owner enhance her learning.

It is interesting to note that, even though these student participants denied the value of the ePortfolio as a learning tool, they spoke of their reflective pieces as the most important aspects of ePortfolio development. Sarah labeled her reflections as “not serious,” meaning she did not invest much effort, time, and thought into them, but admitted that the reflections were unused opportunities for her to “show the real me” (Sarah, Feb. 15, 2006). Gregory shared that
the best aspect of the portfolio for me is the reflections. It is easy enough for me to just throw in a paper, a project, or something else that I did, but then being able to say why you did it and what you got out of it I think is the most helpful as far as my learning goes. It helps you to reflect why you did it and whether you got out of it what you wanted. (Gregory, Feb.13, 2006)

Intuitively, these students spoke about the power of reflection as a quintessence of ePortfolio development in spite of their unwillingness to see their portfolios as tools supporting their learning and progress.

Although these participants did not directly connect ePortfolio development with the opportunities to track and enhance their learning, they suggested that their course instructors and department might view their portfolio products as offering useful evidence and direction for improving the curriculum. One participant felt that the instructors who introduced ePortfolio development in their courses would inspect student portfolios to improve the quality of education they are providing by seeing what progress is made by students and how things could be done more efficiently in the future (Sarah, Feb. 15, 2006).

The department might be able to use our portfolios to see growth in the students, like when comparing portfolio from 10 years from now. Maybe they will or not be more in depth, maybe the projects will be better, and they can say, “Why is it turning out that way? How do we make the curriculum better for our student?” (Megan, Feb. 16, 2006)

The department can use [portfolios] as outcomes assessment tools. What students have gotten out of their time in Iowa State in their specific majors that benefits them and what perhaps they did not get for one reason or another and thinking of ways to provide that. (Gregory, Feb. 13, 2006)

Refusing to see their ePortfolios as learning tools, but making suggestions that the course instructors, program, and/or department should be able to make judgments about progress and learn from student portfolio products, these portfolio authors appeared to shift the responsibility of learning onto the institution, which was expected to deliver the “right” kind of education to its recipients. The students’ role was then limited to illustrating how they succeeded in the reception of such education through the best artifacts included in their portfolios.
Faculty Perceptions of ePortfolios

Learning Tool. Unlike their students, the faculty referred to the ePortfolio most frequently as a learning tool. Describing the history of ePortfolio development in the department, one faculty member suggested that the philosophy of the portfolio as a learning tool was rooted in the departmental learning outcomes assessment policies. Before paper-based and ePortfolio development was implemented, the department relied heavily on information collected by means of student, alumni, and faculty surveys, and interviews to provide a comprehensive picture of how students were taught. However, such indirect measures of assessment were not capable of capturing student progress with regard to their starting and exiting learning experiences. Therefore, ePortfolios were visualized as a helpful direct measure of assessment that, if used in combination with indirect measures, would help the department shift the focus from teaching to learning. “This led us to start to think, ’Let’s do a portfolio method because the responsibility for learning will be on the student.’ That is how we began seeing faculty’s role as teaching students to assess their own learning” (Associate Department Chair, Feb. 21, 2006).

Sharing such a philosophy, the course instructors approached ePortfolio development as encouraging students to recognize the importance of individual responsibility and ownership of learning processes.

Ultimately, the goal is that we want students to be able to use the portfolio for their own learning purposes and make it be their own, rather than having it just for the course instructor or department. The portfolio is then a method of being able to look back at what they do well and what they can improve and take responsibility for that. (Program Director, Feb. 21, 2006)

To prompt students to take responsibility for their learning, the faculty participants consistently referred to student reflection and self-assessment as central components of the ePortfolio as a learning tool. Program Director shared that in reflecting about themselves as learners, students became aware of the intellectual processes and strategies they used to approach a situation. Such awareness helped students critique and evaluate their learning, listen to themselves and others, and thus improve their understanding. This faculty participant observed that portfolio reflections exposed student regulatory processes and allowed her to
provide students with the kind of feedback that changed the way they resolved situations and issues (Program Director, Feb. 21, 2006).

Consistent student engagement in metacognitive processes was pronounced to be the key attribute of the concept of the ePortfolio as a learning tool, whereby consistency was associated with the implementation of ePortfolio development and reflective practices both within and beyond the scope of individual courses. Committee Member/Adviser explained the structure of her course and the place of ePortfolio development in it:

I am the instructor for a department orientation course, where I have students start the portfolio, so I have specific goals for students as far as developing the portfolio in that course. As the course instructor what I am looking for within this portfolio is that students have created a reflective piece in the introduction area indicative that they have reflected on their personal and professional goals and as college students they are starting to focus on what they want to achieve as they progress in college and become future professionals. . . . Also within the course I do require the students to interview a professional and include that artifact in the portfolio and very importantly a reflective piece on that learning experience. In addition, students reflect on their communication abilities and include an Evidence of Communication Ability reflection. These are the major pieces, as I want to see as the instructor for the course. So, I tell students that this is just a beginning of a long learning journey and that things they will put in the portfolio will change over time. And this course will be followed by others, in which they will create more mature artifacts. (Committee Member/Adviser, Feb. 22, 2006)

This faculty particularly emphasized that if the implementation of ePortfolios was only limited to her course or few other courses in the dietetics program, the portfolio would become a mere course assignment. Program Director reiterated that the purpose of the portfolio students composed in her course went beyond the production of artifacts and reflective pieces to be included as a demonstration of student attainment of goals and objectives specific to that course.

My intention is that students would be able to review their portfolio throughout their college career and would be able to see what they had accomplished in my class and compare that to what they would accomplish later in their academic career so that they could actually see how their learning and their knowledge, skills, and competencies had progressed. So from the student point is what I would like to see. (Program Director, Feb. 21, 2006)

The continuity of learning portfolios throughout the dietetics program was seen as of utmost importance to successful student learning.
Helping students to move forward is what we aspire. First, as a very fragmented approach—portfolio development within my course, this is what I am doing [as an instructor] in my course. Getting a broader picture of what we [instructors] each are doing within courses as a system is a next step. (Program Director, Feb. 21, 2006)

There was also a unanimous agreement among these faculty that the ePortfolio was not only intended for student learners to take ownership of their learning and perform sustained reflection and examination of their academic work, but also for faculty themselves to look deeply into student learning processes from the viewpoint of the learner (portfolio owner) and be able to see what is actually happening versus what was supposed to happen as outlined in course syllabi. In a sense, the student ePortfolio was viewed as a learning tool for faculty members themselves to systematically engage with ongoing and meaningful assessment of course experiences that students needed to progress in their learning. Student portfolios helped faculty to re-evaluate whether and how students learned what was intended by course syllabi.

I think portfolio development is an opportunity for me as a course instructor to see how the student is growing using the insider’s lens if you will. I come to look at the portfolios as a facilitator, not just an instructor who gives grades and expects to see the best work only. I want to see the progress with that student’s eyes and help. This is how they and I learn. I learn when their portfolios help me make the course better next year, when I add activities to the course that were not there before. (Program Director, Feb. 21, 2006)

Agreeing upon the benefits of the ePortfolio as a learning tool for students to take responsibility for their learning and for faculty to facilitate continuous assessment of student progress, these participants voiced several contradictions accompanying their conception. First, the mandatory course-related artifacts were viewed as the best way to prompt student engagement with ePortfolios. The artifacts created as a result of out-of-class learning were encouraged, but did not generally add to the value of student portfolios. Rather, the ePortfolio process tended to be seen and explained by these faculty participants as focused on the production of and reflection on the course-mandated pieces of student work, which were more likely to receive instructors’ attention and feedback than optional artifacts.

Second, the faculty members saw student portfolios as evolving, but at the same time containing polished artifacts. Such artifacts were generally allowed to be modified during the
course but ultimately were expected to be submitted as finished, top-quality products at the end of the course.

I view the portfolio as educational for students to use in their learning. So, from my perspective it is fine for them to have work in progress, but then as they move through the course they want to be updating it with more polished work. (Program Director, Feb. 21, 2006)

All three faculty endorsed such a position and indicated a preference for the inclusion of polished artifacts in student portfolios, even though they welcomed the temporary presence of work in progress during their courses.

Third, defining ePortfolios as a tool to enhance mastery or learning, these faculty felt that student portfolios should clearly demonstrate satisfactory performance and attainment of goals and objectives set by the course, program, and/or department. Outcomes and performance were seen as a natural result of the learning portfolio in the sense that ultimately a learning portfolio was expected to showcase excellence, not mere progress. Such a perception of the ePortfolio as a learning tool was contradictory and sent mixed messages to students.

Assessment Tool. The faculty participants conceptualized an assessment ePortfolio as organized around the best pieces of work in which students were expected to expose clear understanding of learning outcomes, goals, and objectives intended by the course, program, and/or department. With such a portfolio emphasis was put on student demonstration of satisfactory performance and fulfillment of externally placed requirements. “We say this is a portfolio where specific artifacts need to be included and where students need to show they’ve met these standards through their artifacts and what they can do on the basis of such artifacts” (Department Chair, Feb. 21, 2006).

The faculty generally referred to the assessment portfolio as beneficial to both the institution and individual students. At the institutional level, the showcase portfolio was seen as a way for the course, program, and/or department to demonstrate the quality of delivered education. At the individual level, the assessment portfolio was conceived to be able to illustrate an individual student’s achievement in comparison with intended expectations and standards.
We are starting to implement the [ePortfolio] as a place for students to collect their work—written, oral, electronic work—in one place. I think as student career at Iowa State in our department develops, it is a way for them to showcase their work at Iowa State. . . . Parallel with that we are using it as a means to collect information that we can show accrediting agencies, approval agencies, professional groups who are asking us what our students can do. So, it is kind of two-fold: firstly, it is for the students to showcase what they have learnt and secondly, for us as a way to collect information to showcase the work of the department. (Associate Department Chair, Feb. 21, 2006)

The faculty conceptions of the assessment portfolio at the institutional level revolved mainly around demonstrating the effectiveness of a particular course, the program, and/or the department to accrediting bodies. The participants expressed unanimous agreement that the institutional purpose of assessment portfolios was very straightforward, though requiring a consistency in deciding how they would be selected and presented to reviewing parties. At the time that this research was occurring, the department designed a working document specifying the general nature of mandatory artifacts for each learning outcome in specific FSHN courses for all undergraduate students (see Appendix C). It was envisioned that samples of student work placed in the portfolio in accordance with the working document could be easily extracted from the portfolio environment and placed on a static Web site to give external reviewers a sense of how departmental outcomes and professional standards were achieved by students. Associate Department Chair anticipated reflective pieces accompanying such artifacts to be of lesser interest to external reviewers, given that the reviewers were expected to pay more attention to concrete examples of student learning in which excellence in student understanding and attainment of professional standards were demonstrated.

At the individual level, the assessment portfolio was conceptualized to be filled with course-specific artifacts placed by portfolio authors in the predetermined structure organized around the four portfolio ability areas of Communication, Problem Solving, Social Concerns/Ethics, and Technical Skills, which were created on the basis of the departmental learning outcomes designed for all undergraduate majors. Correct placement of mandatory artifacts by students in the appropriate portfolio areas and completion of accompanying reflective pieces were equated with clear student understanding and compliance of departmental learning outcomes and standards. Consequently, the assessment portfolio was
viewed as an ultimate reflection of what individual students knew and could do while simultaneously demonstrating their understanding of expectations and standards against which their knowledge, skills, and competence were measured.

We as the department agreed upon learning outcomes for all students regardless of majors, and those were then categorized within four different ability areas: Communication, Problem Solving, Social Concerns/Ethics and Technical Skills. Communication, Problem Solving and Social Concerns/Ethics, those abilities were identified for all students in all majors in our department and are stated in the Iowa State catalogue. Those are what we expect from our graduates, to be able to see those outcomes. . . . What I think is valuable about having these in the portfolio is that students can see these are the expectations . . . which are very transparent, this is what we are working towards, so the students know these expectations upfront. (Associate Department Chair, Feb. 21, 2006)

The faculty typically agreed with such a conception of the assessment portfolio at the individual level, but also pointed out it was straightforward and left little room for student initiative.

On one hand, the predetermined structure of the assessment portfolio created a comprehensive schema for both faculty and students to follow, in which the faculty set forth expectations, goals, and objectives for the students to achieve. The presence of such expectations, goals, and objectives acted as a guarantee that faculty assessment of student portfolios would meet the psychometric standards of validity, reliability, fairness, and absence of bias. Therefore it was assumed that students informed of how their performance would be judged against standards would work towards successful attainment of those. On the other hand, the faculty participants understood that such an approach stripped student portfolios of ownership, limiting the role of the student to acts of thoughtless placement of artifacts within the predefined portfolio structure.

These faculty pursued two directions in an attempt to balance this tension of the assessment portfolio. First, students were encouraged to include nonmandated pieces of work, even though such artifacts generally received less faculty attention in the sense that course syllabi tended to focus exclusively on the explanation of course-mandated work in the same way as instructor assessment of student portfolios was concerned mainly with course-related materials.
We are debating how much we require versus what we should suggest, because I think that students should have ownership of their portfolio and make decisions about what they want to include and how to include it. We have been debating whether some assignments are required versus recommended, because we do want students to have flexibility and for them to say, “This example of my work really shows the highlights of this ability,” or maybe they’ve done something outside of class. Maybe they are a student leader in the professional organization or they went out and studied abroad, experience that shows that they have met the outcomes. And as long as they are meeting the outcomes, that’s the purpose. (Committee Member/Adviser, Feb. 22, 2006)

Program Director indicated that she allowed her students to self-select topics for the mandated artifacts, thus allowing students to showcase their knowledge and competence on a topic that was of personal interest to them.

Second, after the use of ePortfolios was piloted in several courses, the fixed structure of the FSHN ePortfolio was reconsidered. The “Add Ability” feature was built into the portfolio to allow portfolio authors to add menu items to the four areas of Communication, Problem Solving, Social Concerns/Ethics, and Technical Skills. The “Add Ability” feature helped students showcase those skills and learning experiences that they felt were beyond the scope of the four areas outlined by the department and, thus, prompted students to add a personal touch to and assume ownership of their portfolios (the researcher’s journal).

However, this feature did not receive much discussion among the faculty, who struggled with defining how exactly students could make use of it and what kind of artifacts could suit such a purpose. Consequently, the “Add Ability” feature was rarely mentioned to students and, when it was brought to their attention, it was associated mainly with the showcasing attribute of the ePortfolio, where it was envisioned to be utilized almost exclusively for the demonstration of student performance in the areas beyond the scope of those identified by the department. The capacity of this feature to facilitate student learning was not particularly emphasized.

Employment Tool. The faculty participants believed in the potential of ePortfolios to enhance student employment opportunities and unanimously agreed that the interface of the ePortfolio template was driven largely by the logic that the portfolio areas of Communication, Problem Solving, Social Concerns/Ethics and Technical Skills not only represented the
learning outcomes intended by the program and department but also mirrored the qualities valued in the dietetics profession. In addition, the faculty members believed that the “Add Ability” feature could be used by student portfolio owners to bring a variety of artifacts useful for the job searching process to their employment portfolios. This feature, however, did not receive much explanation in student–faculty conversations.

These faculty respondents tended to emphasize the long-term perspective of ePortfolios as employment tools in the sense that early student coursework was not generally perceived as suitable for seeking employment. Instead, the polished pieces of work to be produced in advanced undergraduate classes were recommended as a better option for inclusion in employment portfolios.

I think for students to include work from their advanced classes is a good bet for their employment portfolio. We are preparing [students] to meet requirements that are expected in the profession. To land a good job they need to showcase what comes from their advanced classes—where they receive a good foundation for what they will do in their workplace. (Program Director, Feb. 21, 2006)

The faculty members described advanced classes as giving ample opportunities for undergraduate students to develop portfolio artifacts of superior quality appropriate for employment portfolios, whereas beginning classes were seen as prompting students to begin thinking about career goals and identifying the kinds of artifacts that could potentially be produced in the future. Arguing for the long-term perspective of employment portfolios, the faculty subtly sent the message that the artifacts created by students as the result of their early coursework did not have sufficient value for future employers and that the development of “real” artifacts ought to be postponed until it was the “right” time for students to engage in a job search.

**Difference in Student and Faculty Perceptions**

In this study, the student and faculty participants perceived ePortfolios differently. However, both students and faculty respondents emphasized the capacity of ePortfolios to save time and effort, offer immediate reward, and decrease discomfort.

The students tended to perceive portfolios as electronic containers, extensive resumes, employment tools, course assignments and, rarely, learning tools, thus understanding
ePortfolio development as product-oriented, not process-oriented. With their intense focus on academic performance, these students were more interested in producing portfolio products of impeccable quality and less in comprehending their learning strategies and progress. The perceived advantages of ePortfolios to contain and manage professional materials (electronic containers) organized in chronological order (extensive resumes) with the purpose of facilitating job search (employment tools) were valued as *saving time and effort*.

ePortfolios as course assignments offered *immediate rewards* to these student participants; the production of course-mandated, polished examples of their work demonstrating the attainment of course goals and objectives brought the reward of receiving a satisfactory grade and successful completion of the course. However, such ePortfolios were understood to be time-limited and were generally abandoned at the end of the course.

Under the practical conditions of academe, student perceptions of ePortfolios as learning tools varied from enthusiastic acceptance by Gregory to the prudent attitude of Megan to rejection by Sarah. The three students represented different stages of progress in the didactic undergraduate program of dietetics. Gregory had taken one, Sarah had taken two, and Megan had taken three portfolio-infused classes.

Having completed only his first semester, Gregory had not yet been subjected to the many academic pressures nor perceived the completion of his first portfolio-infused FSHN 110 Orientation Seminar as a good promise of future academic success. He saw his ePortfolio not only as saving time and effort in management of his learning, but also providing opportunities to showcase his uniqueness and his personal and academic strengths.

Contrary to Gregory’s experience, Sarah referred to her ePortfolio as a *labor-intensive and time-consuming* process. In her second year in the dietetics program, she had already experienced the complexity of the many specialized disciplines in food science and human nutrition and dedicated much time and effort to the successful attainment of academic requirements. She viewed her ePortfolio as another burden to be dealt with in addition to the numerous demands of her sophomore year. Because searching for jobs looked like a distant perspective that did not require Sarah’s immediate attention, the collection, organization, and presentation of artifacts were not her priorities. Sarah also reported that her portfolio was
satisfying only in the sense that she was given a satisfactory grade for her classes in which portfolio development was mandatory. Megan acknowledged that her ePortfolio could potentially help to decrease her discomfort in her job search, but worried that she did not accumulate a sufficient number of artifacts to showcase her achievement to future employers.

Student perceptions of the advantage of ePortfolios were complex and often contradictory. Although ePortfolio development for learning was viewed to be time consuming and requiring investment of effort, the three student participants recognized the power of portfolio reflective components.

Unlike the students, the faculty members, first and foremost, associated ePortfolios with the opportunity to shift to learner-centered assessment, by which students were held accountable for critiquing and evaluating their own learning. The faculty respondents particularly emphasized the potential of ePortfolios to consistently involve students in reflective practices within and beyond the scope of individual courses. The continuity of ePortfolio development was perceived to be a key to successful student learning. Thus ePortfolios as learning tools were reported by faculty members as potentially capable of decreasing discomfort for students as they move towards critical thinking and for faculty members as they engage in systematic meaningful assessment and re-evaluation of the curriculum.

In spite of their passion for ePortfolios as learning tools, these faculty tended to prioritize institutional needs over the needs of individual students. Assessment portfolios served as demonstrations of effective education delivered by FSHN courses, programs, and the department and were envisioned to save time and effort in showcasing the institutional assets. The role of students was then limited to exhibiting clear understanding of course, program, and departmental learning outcomes and successful completion of mandatory portfolio artifacts. This sent mixed messages to students, who were expected to then showcase excellence rather than progress in learning.

Like their students, the faculty valued the advantage of ePortfolios to ease the process of job seeking for future dietetics graduates. However, the reward of enhancing employment opportunities was not perceived to be immediate. Unlike the students, who expected to make
use of their employment portfolios when searching for temporary, summer jobs, the faculty stressed long-term perspectives and advocated for the development of suitable artifacts during advanced undergraduate classes until it was the right time for students to begin searching for jobs.

Research Claim 2: Undergraduate Students, Faculty, and Administrators in this Department Had Different Understandings of ePortfolio Purposes

This section looks at the way in which these student and faculty participants expressed their purposes of engaging in ePortfolio development and the values and beliefs they attached to it. Student understanding of portfolio purposes revolved around two conflicting perspectives: the purpose to “fill out the portfolio and be done with it” and the intention to showcase to themselves and others what they were capable of doing. Different sociocultural values were tied to these perspectives. The faculty participants were motivated to use ePortfolio development as a data-driven system to improve and showcase the quality of undergraduate education in the FSHN Department.

Student Understanding of ePortfolio Purposes

“Let’s just get this done with.” The theme of “Let’s just get this done with” surfaced particularly in the responses of two students. Sarah described her ePortfolio as an additional burden to the many requirements of her sophomore year. She felt that the mandate to include her class-related work in the ePortfolio was not well rationalized by the instructor and viewed ePortfolio development as a time-consuming, but inevitable requisite to “squeeze through” in order to successfully complete the course.

As we were developing this [portfolio], the instructor was giving us things to put in there. I do not exactly know why she preferred that we put this in here. Maybe for grading reasons—but then she had to print all those papers out anyway to grade them. She told us we had to do this. (Sarah, Feb. 15, 2006)

Confused about the purpose of her ePortfolio, Sarah complied with the course requirements and put the mandatory artifact (the Interview with the Professional paper for the FSHN 110 Orientation Seminar) in her portfolio. In the excerpt below, she reflects on why she felt like “getting done with the portfolio” and, in particular, the interview paper.
Sarah. Well, I see the purpose of this required paper from the instructor’s point, but it is not personally my favorite paper that I’ve written. Learning-wise, I feel it is an OK example [of my work]. It was interesting to go and talk to the professional; it was certainly a good thing to do to . . . However, let me think how to say it. . . . Basically, this was done as an assignment; the reasons for doing it were pretty straightforward and established by someone other than me. . . . So, I personally did not really want to put that and every paper that I was told to, in there, but I had to, so that’s something I could take off now that I am done with FSHN 110.

Researcher. What would you put instead?

Sarah. A better paper that I’ve done, something that I am interested in. Something that highlights my writing abilities. I would first do more research and interviews and then write a different paper and put it in there instead [of the present artifact]. (Sarah, Feb. 15, 2006)

“To get done with it,” Sarah posted the required artifact in her portfolio and was also requested to submit its hard copy to the instructor, who then promptly returned it with positive feedback. Satisfied with her grade, but not the quality of her paper, Sarah did not update the file included in the portfolio. She sensed that the graded hard copy of her paper signified a successfully completed assignment and was left confused and discouraged from further use of her portfolio whose function she perceived as limited to an electronic container.

Another instance of the “Let’s just get it done with” theme surfaced during the conversation with Sarah when she was asked to speak about the importance of the reflective statement that she wrote for her mandatory artifact (Figure 4.7):

Researcher. What did this reflection add to your portfolio?

Sarah. Are you hinting that my reflection is contradicting what I have told you about this paper that it is not my best work? Like here, “I selected this project to put in my portfolio because it highlights my strengths in communication with others and using the information in creative ways”?

Researcher. I am trying to see what value you attach to your reflections.

Sarah. Well, to be honest, we had to write something, so it is not like I actually did select this to put in my portfolio because it highlights my strengths in communications. I just had to put it here, I did not have a choice. The instructor tried to give us ideas, like the reason why we could put this paper in here and how this paper connects with communication skills. So I wrote this as if I had chosen this paper. And I knew my professor would be reading this. (Sarah, Feb. 15, 2006)
Sarah exhibited some understanding about the learning intent for her ePortfolio, but tended to casually dismiss its developmental and reflective perspective. She was more preoccupied with “filling out the portfolio” and being done with it than with embracing her learning as a process documented by means of her ePortfolio.

Megan echoed Sarah’s experiences. She opted to take out a weaker artifact “Interview with the Professional” that she created for her FSHN 110 Orientation Seminar in the first year of her academic career and substitute it with a more mature artifact from a different course. She described her experience:

I just figure that [the Interview paper] was a piece of work ... well, we had to write something, and this wouldn’t have been my choice to put in my portfolio. I had to put it there to do well in the class. I had to write it to say how and why this would be relevant for my future job. But really this was for receiving a good grade. So, I wrote it, but then took it off after the class, because really, this is not a paper of my choice. (Megan the Senior, Feb. 16, 2006)

Megan felt that her paper on folic acid supplementation which she had later used to replaced the interview paper, showcased her ability to recapitulate and analyze research literature. She also was proud of the follow-up presentation she delivered to her classmates, which she wished she would have recorded and brought into her portfolio. Thus, she admitted
that the interview paper was written for the sake of doing a class assignment. She grew so
dissatisfied with the interview paper that as soon as she completed FSHN 110 Orientation
Seminar and created a better artifact, the interview paper was taken out of her portfolio.

“I want to shine for myself and others.” Both Sarah and Megan viewed their
ePortfolios as a necessity to “squeeze” through to receive a good grade. However, Megan
also saw the potential of her ePortfolio to showcase her uniqueness and prove to herself and
others what she was capable of doing. She found a positive aspect in the ordeal with the
mandatory artifact “Interview with the Professional,” which she had opted to replace with a
more mature artifact later in her academic career.

Putting this [Interview with the Professional] paper was like a practice of other things
that can go in this portfolio. And it was probably good to do, because it gives you
something to refer to when you are putting other things in here. . . . I feel this was an
example of what I would possibly consider putting in here. . . . I mean, potentially this
portfolio might be a good production if I keep up on it. I do want to shine for myself
and others with this portfolio. (Megan the Senior, Feb. 16, 2006)

This student was particularly proud of the introductory section of her portfolio, where
she referred to the rich experience she had as a sports professional and gymnastics coach
working 10 years with girls and boys of different ages, backgrounds, and skills. Megan was
keen to describe how she had grown and learned as a coach and dietetics professional. She
particularly emphasized the highlights of her performance as a head team professional at two
national level competitions. She felt that her knowledge of healthy eating and eating disorders
would become particularly helpful as she proceeded with her gymnastics career. Because of
such a unique combination of her life and academic experiences, Megan perceived her
portfolio as capable of demonstrating her strengths and uniqueness.

When we first [engaged in portfolio development] at the FSHN 110 Orientation
Seminar, honestly, I did not think it was something I would use. But now as I learn
more and more throughout the years and classes, it is more of like, “Oh, this actually
is something unique that I have, that not every student has.” (Megan, Feb. 16, 2006)

Gregory lacked the vast experiences of Megan, but he insisted that his ePortfolio
exposed many aspects of his personality, which he felt distinguished him among the rest of
the freshmen students. Gregory created a Leadership section in his portfolio by using the Add
Ability feature. He selected his Eagle Scout project for inclusion in the Leadership section to
demonstrate how he had provided guidance to new members of the Boy Scouts of America organization. He recollected the process of selecting the Eagle Scout artifact as a highly personal endeavor, in which he had the opportunity to make judgments and choices and focus on his uniqueness.

Another optional artifact that this student brought to his portfolio was the analysis of Walter Evans’ pictures taken for James Agee’s *Let Us Now Praise Famous Men*, a book depicting the daily living of an average White family of tenant farmers. In his paper, Gregory described two photographs of Evans and interpreted their connection to Agee’s book. Gregory made a decision to place this artifact in the Problem Solving section of his portfolio.

We had to write this for one of my English classes that does not use [ePortfolios]. We had to read this—Agee wrote this thing and Evans made the photographs. So we could choose what and how interpret them. I put this under Problem Solving, because it was pretty hard: I found it difficult to read, understand, and interpret this book, but once I figured it out, it made all the sense to me. Then my analysis just put all the pieces together, and I figured this would be a good one to show my problem solving. This is a big part of what I am and how I do things, and I want other people to know it. (Gregory, Feb. 13, 2006)

In the optional reflective piece that accompanied this artifact, Gregory explained:

I chose this piece of my work because it shows my ability to read a document, interpret it, and provide a written analysis of what the author had to say. From the paper that I wrote, I learned that how to report my findings to a reader in a professional manner. (an excerpt from the reflection in Gregory’s portfolio)

Gregory was proud of his work, wanted to celebrate the breadth and depth of his learning, and viewed his portfolio as capable of providing insights about his personality and skills and knowledge.

**Faculty Understanding of ePortfolio Purposes**

The faculty participants in this case study described ePortfolios as accommodating the need for assessment and showcasing the quality of undergraduate education in the dietetics program and FSHN Department. Particularly, ePortfolio development was closely tied to laying foundation for a data-driven system to collect evidence of student achievement and attainment of learning outcomes.
ePortfolios as a data-driven system. As part of a data-driven system, ePortfolios were anticipated to act as an evidence-gathering tool displaying a direct connection between student performance and learning outcomes that would be indicative of course, program, and institutional success.

[The idea of] ePortfolios made us focus much more on the student learning outcomes . . . you know because we [consider], “What is it that we intend for students to know, so that we can focus on what it is that we need. What kind of information do we need to collect to prove that the course, program, and department are doing a good job of teaching?” (Associate Department Chair, Feb. 21, 2006)

The vision of ePortfolio development as a data-driven system called for a visible assessment infrastructure. The members of the Outcomes Assessment Committee initiated the departmental discussions on formulating learning outcomes as formal statements of what students should know and be able to do as a result of the course/program impact. The artifact grid (see Table 3.1) was composed to align FSHN departmental outcomes, core courses, and mandated portfolio artifacts. Rubrics were promoted as helpful vehicles for judging student performance and portfolio contents. These efforts were believed to have the beneficial effect of stimulating more systematic departmental engagement in evidence-based planning and decision making.

All three faculty participants pointed out the value of such information gathering for both fostering program improvement and institutional accountability (see Table 4.6). Although stressing the potential of ePortfolios system as a data-driven system to support program enhancement and institutional accountability, Associate Department Chair shared the concern that both administrators and external evaluators might place more emphasis on how the collected information was used rather than on the insights that this information provided about the quality of student learning. She feared that the initiation of the data-driven ePortfolio system may perpetuate faculty perception that assessment and accountability were part of an administrative responsibility and contribute to their reluctance to participate in accountability processes.
Table 4.2. Perceived purposes of ePortfolio Development as a Data-Driven System for Internal Improvement and Institutional Accountability

<table>
<thead>
<tr>
<th>Internal improvement</th>
<th>Institutional accountability</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Making sense of qualitative information to analyze the quality of individual courses</strong></td>
<td><strong>Showcasing student achievement through representative samples of student portfolios</strong></td>
</tr>
<tr>
<td>When I examined the artifacts, there was little evidence that they were reflecting on their learning. Looking back, I understand I need to guide them and their reflections and spend more time on what is a well-written reflective statement. (Committee Member/Adviser, Feb. 22, 2006)</td>
<td>Student portfolios give us a grip of what students know and can do and showcase their achievement to program, department, and institution-wide. (Program Director, Feb. 21, 2006)</td>
</tr>
<tr>
<td><strong>Identifying what graduates of the Dietetics Program and FSHN Department should know, understand and be able to do</strong></td>
<td><strong>Displaying evidence of conformation to the learning outcomes and standards of reviewing agencies</strong></td>
</tr>
<tr>
<td>ePortfolios are helping us to focus on what are the important things that our students need to know. What is it that we are doing? What does our degree/certificate mean? How can we prove it? (Associate Department Chair, Feb. 21, 2006)</td>
<td>Our accrediting agencies, and even University, ask us, “What courses are you teaching to meet our requirements? If they say that our students need to know about food safety and the concepts related to producing safe food, we can tell, “Well, they take Food Processing and Food Microbiology.” But that is not enough, they are asking more detailed information now: “How well can your students identify food-borne illness in preserved or canned foods.” We have the portfolios to pull that information from.” (Associate Department Chair, Feb. 21, 2006)</td>
</tr>
<tr>
<td><strong>Pursuing the need for on-going program improvement through the examination of individual courses and student learning experiences in the program as a whole</strong></td>
<td><strong>Assembling of existing information as the evidentiary basis for picturing the program and department as coherent learning structures</strong></td>
</tr>
<tr>
<td>With this portfolio evidence I hope to see an on-going, not episodic assessment of quality of our program. So that we can improve the teaching and curriculum and pay attention to issues surfacing from portfolio contents. (Program Director, Feb. 21, 2006)</td>
<td>[With ePortfolios] the conversations in the department have been much more, “What do we all do in our classes? They’ve come together in a much more focused way and prompted faculty and administrators work together—not always smoothly, but together, rather than separately, because we are all interested in curriculum changes for the good of our students. (Associate Department Chair, Feb. 21, 2006)</td>
</tr>
</tbody>
</table>
Differences in Student and Faculty Understandings of ePortfolio Purposes

The focus on teaching rather than learning (Guba & Freed, 2000) has long prevailed on the educational arena. In the traditional, teacher-centered paradigm, knowledge is transmitted from teachers to learners; thus the actual acquisition of knowledge is emphasized more than its application, analysis, synthesis, and evaluation (Barr & Tagg, 1995). The instructor role is defined as the primary information giver, whereas the student role is limited to the passive reception of knowledge.

The student respondents in this study saw ePortfolios as another academic burden to bear as a result of such traditional sociocultural assumptions and beliefs. They felt comfortable with following a plan of action outlined in portfolio-infused classes in which they were mandated to create a specific artifact to be later added to their ePortfolios. The purpose of ePortfolios became thus detached from the task of telling the story of student learning progress and was instead transformed into the task of sorting learners into the norm groups with the help of a data-driven system capable of collecting evidence of student achievement and attainment of learning outcomes.

Both students and faculty had to grapple with the fundamental questions about what learning and teaching meant to them and challenge or accept previously introduced ideas. On one hand, the students accepted the fact that portfolio development was mandated to them; thus they were expected to structure it around specific academic expectations. On the other hand, Gregory and Megan challenged such an assumption and reported that they wanted to expose their unique learning and life experiences through the samples of their work in their ePortfolio. Likewise, the instructors had to challenge their assumptions about how people learn and what teachers should do. They understood that portfolios presented a great opportunity for internal improvement and institutional accountability.

The students and faculty in this study had different understandings of ePortfolio development. The students were focused on their individual efforts to succeed (such as successful completion of academic requirements—“fill out the portfolio and be done with it”—or demonstration of their unique strengths and storytelling). Contrary to this, the instructors highlighted the purposes of showcasing the program and institutional effectiveness and using ePortfolios as a data-driven system.
Addressing the Tension

The final part of this chapter describes the research claim that the tension caused by differences in student and faculty perceptions and understandings of ePortfolios was recognized and approached through (a) entrepreneurial activities of those faculty members who were enthusiastic about ePortfolios and (b) leveraging grassroots movement and administrative support for ePortfolios.

The differences in student and faculty conceptualizations of ePortfolios as well as in motivation to engage in portfolio development was well recognized in the department. Both were seen as slowing down the implementation process and obscuring the learning purposes of the portfolio practice, given that ePortfolios were first and foremost positioned as assessment tools to make decisions about student progress by comparison across common tasks. Associate Department Chair, however, felt strongly that although showcasing student achievement and the quality of education was a valid reason to promote portfolio development, it could not overshadow the most important task of promoting the kind of learning in the department and all FSHN academic programs where faculty and administrators worked together to design and deliver curriculum that was coherent and mapped out in a way that valued the sum of student knowledge, skills, and abilities at the end of their academic careers. This vision called for well fit portfolio-infused curricular activities that would (a) prepare competitive new professionals (support for learning), (b) allow for continuous program and departmental revisions (program assessment), and (c) conform to the learning outcomes and standards of reviewing agencies and public demands for institutional accountability (Associate Department Chair, Feb. 21, 2006; researcher’s journal). This required the close examination of the organizational culture in the department as well as the launching a series of activities to successfully implement ePortfolios for multiple purposes.

Organizational Culture in the Department

A quick glimpse at the organizational culture of this department is needed to appreciate the significance and scope of the entrepreneurial portfolio activities launched by the enthusiastic faculty participants: Associate Department Chair, Program Director, and Academic Adviser/Instructor. The organizational mission and goals are reflective of the
institutional culture and bring forth the efforts of the members of an organization towards building a common cohesive rationale for that organization’s existence and communicating its purpose to nonmembers.

Generally, a mission statement not only contains the information about what the organization does, who it serves, and what it aspires to achieve in the future, but also inspires the members to contribute to the success of a joint endeavor. In higher education, a mission statement of an academic program sets out the direction as to what is expected of faculty and students and helps measure the extent to which various activities are consistent with the teaching and learning philosophy of a particular program. It is a common practice to link the mission statement of an academic department and/or program to the mission of the educational establishment of which it is a part. Thus, the mission of a department/program supports the mission of a larger academic organization (Cole, 2002). The mission statement and goals reflect organizational culture and belong to the norms in accordance with which the organization as a social system “tell[s] individuals what behavior they are expected to perform” (Rogers, 2003, p. 26).

**Departmental Mission and Goals.** The FSHN Department’s mission stated:

The Department of Food Science and Human Nutrition, jointly administered by the Colleges of Agriculture and Family and Consumer Sciences, offers and promotes curricula, courses, and training in food science and human nutrition, with careful consideration of the needs of its students. It is the department’s duty to provide current and objective information about food science and nutrition to all Iowans, their government leaders, those engaged in food processing and distribution and those affecting food selection. In the public interest, the department conducts research in food science, nutrition, and related areas, using available resources to study topics of significance to these disciplines. In all of its efforts, the department aims to contribute to health and well being of the state, the nation, and the world. (Department of FSHN, 2006)

This mission statement emphasizes the pragmatic orientation of education, concerned primarily with arming undergraduate students with skills and competencies necessary for entering workforce or graduate school. Program graduates are envisioned to be novice professionals knowledgeable in food and nutritional services for individuals, groups, and communities. The purpose of the department then revolves around the provision of the kind
of training that considers the needs of its students and the profession and offers a curriculum built on current and objective information about food science and human nutrition.

Though placing consideration for student needs first in the list of its responsibilities, the department appears to focus very heavily on the quality and delivery of instruction. Terms, such as “provision of curriculum” seem to restrict student roles to the consumption of “current and objective information about food science and human nutrition” (Department of FSHN, 2006) and imply that successful student attainment of skills and competencies is a means to the end of dietetics/food science education. Therefore, the mission statement appears to hold faculty members responsible for what and how students learned.

**Entrepreneurial Activities**

The three faculty in this case study engaged in several entrepreneurial activities that were particularly instrumental in helping the department and its programs embrace the importance of using ePortfolios for multiple purposes.

**Informal and Formal Portfolio Events**

Together with the Outcomes Assessment Committee, Associate Department Chair drove the department-wide discussion on aligning college-, departmental-, and program-specific outcomes to map out the curriculum with ePortfolio activities. Such a discussion involved many one-on-one contacts with FSHN faculty and staff, in which she (as well as Academic Advisor/Instructor and Program Director) tried to informally persuade the faculty and staff of the necessity to follow a comprehensive outcomes assessment plan (the researcher’s journal). All three faculty participants in this case study were adamant about pursuing a systems perspective on learner-centered teaching and advocated for enhancing student learning experiences within the department as a whole rather than exclusively concentrating on the effectiveness of an individual course for student learning (from the researcher’s journal).

All three faculty members were seen by their colleagues as knowledgeable in assessment policies due to their attendance of professional conferences and knowledge of university, departmental and program-specific documents and outcomes assessment policies.
For instance, they participated in a number of ISU on-campus activities and national conferences that provided useful information on assessment methods and techniques, such as the 2004 Las Vegas Assessment Symposium, 2005 Iowa Dietetics Association Annual Meeting, 2004 American Dietetics Association Food and Nutrition Conference and Exhibition. In addition, all three published articles on their work in classroom and curriculum innovations in assessment in conference proceedings and specialized journals, such as the *Journal of Food Science Education* (from the researcher’s field notes).

Associate Department Chair repeatedly brought up the issues of ePortfolios at departmental meetings, thus building a support system for portfolio-using faculty. For example, a 2005 FSHN faculty retreat organized by the committee was dedicated to raising faculty awareness about the progress of ePortfolio development in the department. During the retreat, an FSHN ePortfolio template was demonstrated by Academic Advisor/Instructor and numerous questions about the benefits of this educational phenomenon were addressed by both Program Director and Associate Department Chair. Academic Advisor/Instructor and Program Director, insiders to the organizational culture of the department, modeled the innovative method by using ePortfolios in their classes. Open for questions and one-on-one informal conversations as well as willing to speak about ePortfolios in formal departmental events, these faculty members pushed the creation of the working document that specified in what classes and how ePortfolios should be implemented (Appendix B). The document was preceded by numerous formal and informal conversations that Academic Advisor/Instructor, Program Director, and Associate Department Chair had with FSHN faculty to persuade the latter of a systematic approach to outcomes assessment in portfolio development. Instructors of FSHN courses that were identified as contributing most to student attainment of departmental outcomes were approached individually to request course syllabi, descriptions of course outcomes related to departmental outcomes, course-specific artifacts to include in student portfolios, and assessment methods to evaluate identified artifacts. After this information was made available, a working matrix of required artifacts for mandatory FSHN courses for all FSHN undergraduate students was devised.
Thus, the personal influence of these key faculty figures helped to mobilize the faculty community for remapping the FSHN curriculum. This process had not been finished at the time of this research. Part of the faculty community was struggling with understanding how ePortfolios fit with the FSHN undergraduate curriculum. Dealing with different attitudes and behaviors towards portfolio development was part of the routine of the Associate Department Chair.

We are having some problems with [formulating a common vision for portfolio practice in the department]. We have to do some education [of faculty] if we want to continue. Right now we are asking faculty to make sure these departmental outcomes are stated on their syllabi and they identify assignments for portfolio artifacts. It has been a big—I mean, we’ve been working on that for a year. We have been saying, please, get these statements and match what you are doing with what we’ve agreed on as being departmental outcomes. So, even getting that part accomplished has been a long process. So, faculty, most of the faculty, are not seeing the big picture. They are only seeing what’s being requested of them. Several faculty expressed reluctance to work on this. Talking to them, helping them to understand and see the whys has been part of the process. (Associate Department Chair, Feb 21, 2006)

Searching for Additional Funding

Associate Department Chair felt that time and additional funding might help her to sell this vision to all FSHN faculty. Working with enthusiastic pioneers, such as Academic Advisor/Instructor and Dietetics Program Director, Associate Department Chair came to realization that incremental implementation was the key.

I cannot require all faculty members to be in tune with what is happening. We cannot do all of this at once. We started off small, you know, people like Academic Advisor/Instructor and Program Director, that are enthusiastic and see the impetus for using [ePortfolios] for assessment and accreditation. . . . But then we cannot do all at once. We need to pace the process. (Associate Department Chair, Feb 21, 2006)

Associate Department Chair saw additional resources as an indispensable part of making successful progress. She particularly stressed the provision of funds for pedagogical and technological support of the FSHN faculty. She was very persistent in looking for grant opportunities with a particular focus on ePortfolios. She initiated the writing of three grants and was successful in receiving one at the time of this research. One of the proposals she co-authored with Program Director focused on changing the organizational culture in the department to embrace the importance of ePortfolios to support learning, program
assessment, and institutional accountability and produce a data-driven system for continuous improvement of the quality of undergraduate education at the university and the department.

What I want with this [grant writing] is to employ people who can come and bring new ideas and ignite the process here. I also want the faculty know that the support is here, and that they are not alone. I need consultants who can come, and talk, and help to set up things. (Associate Department Chair, Feb 21, 2006)

The acquisition of funds was necessary to ignite both the technological and pedagogical support for portfolio development. For instance, in another grant submitted to USDA, Associate Department Chair described the needs for (a) teaching faculty technology skills so they could comfortably use ePortfolios, (b) building a new portfolio interface to allow aggregation of data for program review and accreditation purposes, and (c) introducing pedagogical workshops and seminars to faculty that would address various aspects of ePortfolio development.

**Modeling the Portfolio Practice**

Mapping the curriculum with ePortfolio activities as suggested by the working document matrix was not enough. Modeling the portfolio practice for the faculty members was by far more important, and Associate Department Chair, together with Advisor/Instructor and Program Director, was highly cognizant of it.

Now that we have artifacts associated with standards, and we have this departmental assessment matrix, now how do we in fact know what the quality looks like with regards to that standard? We are asking the faculty to include their syllabi, and assessment rubrics, and student examples, and you would expect that this could help us to create a common understanding of what is good. This is how we would mine for data, but for the data to be there, we need to educate the faculty and model the [portfolio] practice. (Associate Department Chair, Feb 21, 2006)

This modeling occurred at the departmental level. During the FSHN annual retreat of 2006, the update of the eDoc FSHN ePortfolio interface was narrated by Academic Advisor/Instructor. The rest of the retreat was dedicated to guiding faculty and structuring portfolio reflection. Associate Department Chair invited a guest speaker from the Department of English who talked about the added value of reflection to disciplinary learning and dedicated much time to the reflective pieces as components of a learning portfolio. Faculty
members then were requested to design reflective assignments that might accompany the learning activities in their classes.

Twice a semester FSHN faculty members were sent out e-mail invitations to eDoc ePortfolio workshops. These were normally organized at Noon and conducted by portfolio-using faculty, who not only walked the audience through the eDoc FSHN template, but also shared how the students in their classes used ePortfolios.

The modeling of ePortfolio practice was particularly stressed in a grant submitted to the National Science Foundation and co-authored by Associate Department Chair, Academic Advisor/Instructor, Program Director, and the researcher. This grant proposal spoke to the idea of creating a departmental portfolio that would draw on the best examples of portfolio practice in the FSHN courses and thus enable faculty members to learn from such modeling.

In summary, the faculty participants in this case study were involved in a range of entrepreneurial activities to address the tension of multiple purposes of ePortfolios in the department. These included planning informal and formal departmental events, searching for additional funds, and modeling the ePortfolio practice.

**Leveraging the Grassroots Movement and Administrative Support for ePortfolios**

Both Academic Advisor/Instructor and Program Director began using ePortfolios before ePortfolios were recognized by the department as powerful multipurpose tools for learning, program assessment, and institutional accountability. This grassroots faculty engagement was very characteristic of this department. Academic Advisor/Instructor described the strong feeling of ownership she felt as she participated in the design, development, and implementation of the eDoc FSHN template:

> This is vital here—a group of faculty and students, who came in later, own this portfolio. I started using it because I was talking to [the eDoc programmer] all the time that this is what we need. He would listen and then change the portfolio features. We would look and say, “Yes, this is exactly how we want it to be!” This kind of ownership sustains ePortfolios in this department—first you design this template, then you pilot it with your students and it works nicely for teaching and learning. Then you are excited to share with others, improve, and sustain eDoc. (Committee Member/Adviser, Feb. 22, 2006)
Program Director explained how the sense of ownership grew into the necessity to attract a wider circle of faculty into this pedagogical phenomenon. Because [faculty members] work closely together, we discuss things. Especially, when faculty are more than colleagues. You know, you share problems and successes. This is when you see others realize, “Aha, the portfolio? I can maybe use it too.” So, it then spreads across the program, because we all have the same concerns and problems, and then you talk about [ePortfolios] department-wide. (Program Director, Feb. 21, 2006)

Associate Department Chair suggested that the broad involvement of faculty members, together with the feeling of ownership, spoke to the organic nature of portfolio implementation. It was crucial for ePortfolio development to not be forced onto faculty members in order to not compromise their academic freedom. Rather, getting faculty members excited about the potential of ePortfolios to serve multiple purposes was the key factor in this process.

However, she acknowledged that ePortfolios could truly become beneficial for student learning, program assessment, and institutional accountability only when they were an integral part of the program and departmental curriculum. The participation and support of administration would mean a philosophical commitment with regards to the department’s internal and external political dynamics. The official recognition of ePortfolios would demonstrate the reinvigorated sense of public purpose within and outside of the department, and the department would be seen as prepared for careful portfolio planning and evaluation, thoughtful of the necessity of incremental steps, and allowing for sufficient time for all faculty and students to embrace and meaningfully use ePortfolios.

This is why it is important to get more financial support, but not only that. Money will not solve all our issues. We should think about incorporating ePortfolios into all departmental key events and messages we are sending to the faculty and students. (Associate Department Chair, Feb 21, 2006)

The administrative support leveraged with grassroots movement in this department was believed to potentially sustain the implementation of ePortfolios for multiple purposes in this department (the researcher’s journal).
CHAPTER 5: DISCUSSION

This chapter considers the implications of the case study of one department using ePortfolios for the multiple purposes of support for learning, program assessment, and institutional accountability in higher education. The chapter is organized to first provide an overview of the case study and research findings. Next the research process itself is considered as yet another outcome of this case study, using the authors' personal voice to describe five factors that made a strong impact on the way this research was performed, analyzed, and presented. To conclude the chapter, the research results are reviewed and related to prior research and literature on electronic portfolios.

Overview of Study

The literature review in Chapter 2 suggested that electronic portfolio development in higher education is entangled in the web of tensions created by the multiple purposes of support for learning, program assessment, and institutional accountability, with portfolios as assessment tools compete against portfolios as reflective tools. Assessment portfolios act as testing devices and are used to make inferences about learning and assess student performance by comparing common tasks (Anderson & DeMeulle, 1998; Paulson & Paulson, 1996; Snyder et al., 1998).

Electronic portfolios as reflective tools function to support learning by fostering student progress over time and prompting meaningful metacognitive processes. Engaged in reflective electronic portfolio development, students are recognized as developing learners whose knowledge and understanding are constantly evolving and documented/represented in their portfolios (Darling-Harmond et al., 1993; Paulson et al., 1991; Snyder et al., 1993; Wade & Yarbrough, 1996). The reflective portfolio practice encourages thinking about students as individuals to be assessed across the same caliber of context-specific information.

This case study identified the existence of purposeful tension and investigated the ways in which the multiple purposes of support for learning, program assessment, and institutional accountability found expression in the electronic portfolio practice in one department. The research site for this study was purposefully chosen. The Department of
FSHN at ISU was the most prominent and mature participant of the campus-wide eDoc electronic portfolio initiative. Representatives of this department, including faculty and undergraduate students, designed, piloted, debugged, and improved the eDoc FSHN electronic portfolio template. The template was structured around four departmental ability areas and allowed for adding items to the predefined portfolio organization. Students owned and controlled their ePortfolios by organizing artifacts, sharing access with different audiences, and allowing participation of peers, reviewers, and other stakeholders in their portfolio spaces. Having previous experience with paper-based portfolios, the department integrated ePortfolios into its undergraduate curriculum and used the portfolio data for tracking student progress, assessing the quality of its programs, and preparing for accreditation.

Six research participants, three faculty members and three students, proved instrumental in gaining insights into the complexity of this research situation and ways in which ePortfolios were used in the department. The three faculty members described in this work (Committee Member/Adviser, Program Director, Associate Department Chair) represented different degrees of administrative power. All were enthusiastic advocates of electronic portfolios who modeled the practice for the rest of the department and participated in departmental activities to promote electronic portfolios. The three student participants created electronic portfolios as part of their course/program requirements and had different experiences with and conceptualizations of ePortfolios.

A qualitative interpretive approach was adapted for this research. Data rich in content and depth was collected from a variety of sources, including semi-structured interviews with the students and faculty members; student electronic portfolios; course, program, and departmental documentation; observations; and participant feedback. The author’s role was that of a participant researcher who was both an insider and outsider to this research situation.

The analytical procedure employed in this study, process tracing through lateral and vertical iteration (Steinberg, 2004), distinguished between the causal relationships of dependent and independent variables and larger, macrocultural processes and forces shaping dependent variables. Themes and information groups arose from the application of such
perspectives: Themes were commonalities that emerged within and across semi-structured interviews, and the information groups encompassed common causal relationships from other information sources that were supported by research claims generated from semi-structured interviews.

The case-study framework allowed the complexity of the research situation to be brought forth as the department and its members (students, faculty members and administrators) were engaged in the disorganized and complex process of coming to grips with the multiple purposes of ePortfolios. The case-study methodology offered both a holistic and detailed narration of what was happening in this department and helped to elucidate the operation of causal mechanisms in this case.

**Research Findings**

The research results revealed that the multiple purposes of support for learning, program assessment, and institutional accountability created a tension in this department that was triggered by perceptual differences on the part of students and faculty as well as differences in understanding the purposes of electronic portfolio development. This tension was recognized and addressed through entrepreneurial participation of the faculty and the leveraging of grassroots and administrative support for this educational phenomenon. The research questions from Chapter 1 are now used to structure the reiteration of research findings.

**How Do ePortfolios Support Learning?**

Both students and faculty in this case study conceptualized electronic portfolios as learning tools. All particularly emphasized the value of reflections. The students saw reflections as an opportunity to connect their learning experiences and capture their way of thinking about what and how they learned.

The reflections allow me to explain things, . . . things that help me understand what I did with this assignment. When I write an assignment I am told to think about things like what do I do well? what would I do differently? So, it is a good guidance.

(Gregory, Feb. 13, 2006)
The students reported that it was not so much the quality of an artifact that mattered as the quality of their reflection on the artifact that helped them recognize and think about their metacognitive processes as well as coherently rationalize why the artifact had a place in their electronic portfolios. The role of reflection was conceptualized differently when these students spoke about electronic portfolios as course assignments. The reflective component then was described as another burden to their course load that was routinely written at the very last moment to receive a good grade and “be done with it.”

The idea of learning portfolios dominated faculty conversations, revolving around student reflection and self-assessment as regulatory processes whose development was rated as one of the highest priority of the department and its programs.

Unlike the faculty, the students tended to emphasize the practical portfolio attributes of collecting, storing, organizing, and distributing rather than documenting and enhancing their growth. Thus, the students most frequently conceptualized ePortfolios as containers, extensive resumes, employment tools, course assignments, and rarely, learning tools placing the demonstration of successful academic performance above the demonstration of growth and improvement.

*How do ePortfolios Support Program Assessment?*

The faculty participants conceptualized ePortfolios as assessment tools to be used for program assessment. The structure of the eDoc FSHN electronic portfolio template that was built around departmental learning outcomes was perceived as a convenient schema to help the department judge the quality of its undergraduate curriculum. The faculty felt this structure informed students of expectations, goals, and objectives to be achieved and allowed communication of the standards against which successful student attainment would be evaluated. The evidence collected from such portfolios was used to (a) make sense of qualitative information to analyze the quality of individual courses; (b) identify what graduates of the department should know, understand, and be able to do; and (c) persistently examine individual courses and student learning in the program as a whole.
How Do ePortfolios Support Institutional Accountability?

Using ePortfolios for showcasing institutional effectiveness was a high priority for the faculty participants, who believed the portfolio contents could present evidence demonstrative of institutional performance. ePortfolios were described as a foundation of the data-driven system, whereby student achievement was showcased through representative portfolio samples. ePortfolios provided evidence that confirmed institutional conformity to the learning outcomes and standards of reviewing agencies, as well as helped to picture the department as a coherent learning structure. Associate Department Chair explained that accountability is everywhere in education. We are accountable to the public as to how we prepare young professionals. If we are asked questions like what you do as a department to make sure our graduates have the skills and knowledge to function as dietitians and food technologists, these portfolios are what we rely on. If the reviewing agency just pulls out a couple of [portfolios] at random, and by looking at the student artifacts confirms that we in fact are doing well as a department, then this is why we need this portfolio development as a department. (Associate Department Chair, Feb. 21, 2006)

How Do these Purposes Co-exist and Work Together and/or Against Each Other?

The multiple purposes of support for learning, program assessment, and institutional accountability created a tension in this department that was triggered by perceptual differences of portfolio development by students and faculty and student, faculty, and administrator differences in understanding electronic portfolio purposes. The student participants conceptualized ePortfolios as electronic containers, extensive resumes, employment tools, course assignments, and rarely, learning tools, thus understanding electronic portfolio development as product oriented, not process oriented. The faculty members in this study associated electronic portfolios with learning tools, assessment tools, and employment tools. They appeared to prioritize institutional needs over the needs of individual students, perceiving assessment portfolios as being demonstrative of the quality of the FSHN undergraduate curriculum.

Student understanding of electronic portfolio purposes revolved around two conflicting perspectives: “to fill out the portfolio and be done with it” and to showcase to themselves and others their skills, knowledge, and thinking processes. The faculty in this
study viewed the purposes of electronic portfolio development as serving a data-driven system to improve and showcase the quality of undergraduate education in the department.

The tension of the multiple purposes was recognized and regulated through entrepreneurial participation of the faculty and the leveraging of grassroots and administrative support for this educational phenomenon. Such activities included informal and formal ePortfolio events in the form of both (a) numerous one-on-one conversations and contacts with FSHN faculty members that were initiated by the portfolio-using faculty and (b) large departmental meetings opening up discussions on the use of this educational practice in FSHN. Additionally, pioneering instructors modeled the portfolio practice. Thus, both the personal influence of the key faculty figures and the formulation of a common vision for electronic portfolio development in the department defined the implementation process. The search for additional funding was articulated as another important necessity to ignite departmental support for ePortfolios.

Individual grassroots support for the multiple purposes of ePortfolios was viewed as inseparably paired with administrative support in order to sustain the implementation process. Administrative support was perceived as the institutional commitment to carefully plan and evaluate the incremental infusion of the electronic portfolio practice into the FSHN undergraduate curriculum.

**Researcher’s Perspective on the Research Process (Using Personal Voice)**

Alongside the findings that directly address the research questions asked in Chapter 1, the research process used in this case study offered additional important insights, because the research process itself was multifaceted and added another layer of complexity to the research situation. The role of the participant researcher imposed on me, the researcher, a ubiquitous status as I was both an insider and outsider to the research site. On one hand, I was fully immersed in the context, but on the other hand, I had to maintain a balanced view of what she was witnessing. The balance required stepping back and taking time for incubating the information and reflecting upon it. Next I convey yet another finding of this study—the impact of the research process on this case study. I use my personal voice to outline my intimate connection with the topic of inquiry, which is intricately interwoven with “self
examination, significant personal learning, and change” (Stiles, 1993, p. 604). Conducting this research, I learned a great deal about myself, my professional development, and my ways of dealing with research dilemmas.

My choice of the research topic was influenced by my belief in the potential of ePortfolios to be used for the multiple purposes of support for learning, program assessment, and institutional accountability. My major aspiration to research how multiple purposes are expressed in higher education stemmed from, first, my extensive and intensive involvement with the eDoc electronic portfolio system, and second, from close work with one department and its faculty members and administrators who were dedicated ePortfolio advocates. Selecting this research topic was both a way of probing my subjectivity (of which passion is a necessary ingredient) and combining my research interests with the desire to contribute to my field of study. In this final reflection, I briefly focus on what stood out as the most challenging aspects of this case study, such as shaping relationships with the research participants, functioning as a participant researcher, engaging with the data, writing up research results, and locating myself in the research process. I feel strongly about each of those aspects, and believe they define, to a large degree, this case study.

**Shaping Relationships with the Research Participants**

Shaping relationships, particularly with the three faculty members, was absolutely critical for this case study. All three served as my gatekeepers to the department; their trust in me and my research has been central to our professional relationship. I felt fortunate to get to know these educators, who were passionate about learning, teaching, and electronic portfolios. These were people who found themselves amidst change, both technological and pedagogical, sometimes frustrated, sometimes elated, having to deal with the complexity of the situation. All three faculty members were the driving force behind electronic portfolio implementation, all three served as my entry to the department, and all three were most eager to learn from and with me.

The Associate Department Chair stood out as the one who made the most remarkable impact on both the way this research was shaped and my professional career. Many informal conversations as well as informal and formal observations that I carried out as my research
progressed helped me to become aware of the complicated and complex duties of this individual in the department. Throughout my encounters with Associate Department Chair, I took endless notes, focusing largely on her discourses and her ways of forming and sustaining professional relationships, accounting for the dynamics of various situations that arose as the department proceeded to implement electronic portfolios. Associate Department Chair was acutely aware of my observations but considerate of my research needs. As I composed the dissertation, I used my observation notes as an instrument to help me recall a plethora of details that I might have otherwise skipped.

As I am revising the questions for my semi-structured interview, I am scanning through the comments that I took at [last week’s] lunch break with Associate Department Chair, Program Director, and Outcomes Committee Member/Instructor. As they were discussing the results of the last faculty retreat where all three of them had promoted the use of electronic portfolios to their colleagues, Associate Department Chair’s voice was particularly powerful, even somewhat dominating the conversation. She was disturbed by the fact that she received very few questions about electronic portfolios after her presentation at the retreat. She was afraid that the lack of interest was indicative of a whole range of issues that would impede the progress. She was well composed though, but definitely restless inside and her face betrayed that a bit. (from the researcher’s journal, January 27, 2007)

As I conducted a semi-structured interview with Associate Department Chair, I brought up the issue of the faculty retreat. When asked why receiving questions during her presentation was so crucial, Associate Department Chair disclosed her vision of electronic portfolio practice, in which involving others in the leadership as well as creating viable grassroots support for electronic portfolios were indispensable elements of success. I stressed the significance of those elements in the second part of Chapter 4.

The semi-structured interviews that I conducted with the participants were scheduled to conveniently fit their calendars. The interview with Associate Department Chair occurred shortly after the faculty retreat, which I believe influenced the nature of our conversation. She did not just recall the events directly related to the portfolio history in the department, but positioned them in the context of her current understanding of this educational phenomenon. Not frozen in time, dynamic accounts of her understanding of what was occurring in the department sifted through her vision of the role of multipurpose portfolios added another layer of complexity to my analysis. It was very challenging to handle the additional load of
work and responsibility of informing my audience about this individual’s never static and constantly evolving understanding.

**Functioning as a Participant Researcher**

The intimate professional relationship with the faculty in this department was instrumental in making me feel comfortable in my role as a participant researcher. Functioning as a participant researcher I obtained access to information that might not have been attainable otherwise. As described previously, I was actively involved in departmental activities, which made everyone in this research situation acutely aware of my presence and intent to collect information. The fact that other participants knew of my role both facilitated and interfered with my research purposes in the sense that the participants might have over- or underperformed being conscious of my observations and data collection. An excerpt from my research journal shows my concern as I shared my tentative research findings with the three faculty members:

Yesterday all four of us [Committee Member/Adviser, Program Director and Associate Department Chair] went out for lunch that we had planned long before. [Committee Member/Adviser] is disheartened with the quality of student reflections in her class. She justifies it by the fact that they are all freshmen and have a long way to go before they make sense of the kind of quality she expects from them. She says she needs to work on the guided questions for that reflective assignments and then laughingly, “Lesya, what are you writing again?” Well, I am taking my notes as usual, and I thought everybody was used to it. Apparently, everybody might be NOT so very used to it. I take it for granted, but, apparently, [Committee Member/Adviser] feels I am going to analyze what she is doing. Again. . . . Which makes me think the three of them are very conscious of me as a researcher, even in the social situation like this, when we came to have some Chinese and mostly talk about our leisure. I wonder how much their realization of my role puts them in the position of thinking carefully before saying something. (April 12, 2006)

Under such circumstances, I had to make a subtle distinction between observed and inferred behavior (Wolcott, 2001). Armed with my constant companion, my notebook, I would capture every important fact and/or event. However, the subtleties of my participants’ body language and/or inflection were much harder to translate into words. I also struggled with the acts of seeing and interpreting, fearing that my accounts of observed behavior were often substituted with reports of inferred behavior, an easy target for being “subjectified” by
the researcher’s way of thinking (Wolcott). It was extremely challenging to balance the observed and inferred functioning as a participant researcher. I constantly reminded myself that I was only able to report from my own perspective how the participants felt about the events and experiences they depicted. The meaning making that I, at first, attributed to be the mere responsibility of my respondents turned out to be mine as much as theirs. As I struggled with the idea of the perceived and the inferred I tried to be very accurate in my accounts of various situations reporting what I actually saw and heard, resisting, to the best of my ability, the temptation to infer something. I followed Wolcott’s suggestion to “stay ‘descriptive’ as long as possible” (p. 32) always keeping in my mind that there is a challenge in trying to elicit thick descriptions while staying away from premature analysis before I had sufficient data to support it.

**Engaging with the Data**

The friendships that I developed with my faculty participants, as well as my status as a participant researcher, made me consider carefully my engagement with the data. Process tracing, which I used to analyze the collected evidence, relies heavily on the narratives of actors who participate in and closely observe the research phenomenon (Steinberg, 2004), and as a result “interviews [and narrative accounts] are often the best, and sometimes the only information source for detailed insights into causal mechanisms, even in case with extensive archival records” (Steinberg, ¶ 13). Examining data from such accounts and interviews presents quite an undertaking in the sense that the research subjects have their own opinions about the causal effects that they are observing in their social situations. The participants’ memories, ways of responding to questions, and lack of awareness of certain factors and over concentration on others carries serious limitations and/or leaves places for biased and/or inaccurate representations of reality. Steinberg explained that there are two major sources speaking to such an effect: First, actors often underestimate the impact of their efforts and activities; and second, they are prone to underreporting the degree to which a causal impact is affected by macrostructural conditions.

My work and research in the department began amidst departmental efforts to implement electronic portfolios for multiple purposes. Coming in the middle of the process, I
relied heavily on insiders’ accounts of the history of portfolios in the department. Many times I received conflicting reports from different interlocutors, which I had to carefully sift through and compare. The faculty participants were so caught up in the complexity of the social situation in which they were expected to proactively and purposefully act daily that these actions and efforts stood out more visibly in their memories than the causal effects produced by them. In the same manner, the student participants were so focused on their individual process of portfolio development that they tended to undervalue the impact of macrostructural factors. I was acutely aware of these limitations and attempted to characterize a causal process using Steinberg’s (2004) iterative approach along two axes, lateral and vertical.

Another challenge in analyzing the evidence came from my broad knowledge of electronic portfolio literature (see Chapter 2). When coding semi-structured interviews and other data during the first round, I was quick to see themes from the literature. In the subsequent rounds, I had to step aside and let the data speak to me rather than force the data to reflect what I had encountered in the literature sources.

The participant feedback enhanced my realization that the final interpretation of the findings was mine. It also instilled in me the sense of satisfaction with the fashion in which I handled data interpretation in the context lateral and vertical iterations.

**Writing up Research Results**

Writing up the research results also occurred in an iterative, cyclical, and nonlinear manner. The data were telling a story that needed to be put in the “right” words (Wolcott, 2001). I was entangled in a web of emotions, struggling to reflect the richness of the research situation and avoid repetitions. I strived to capture the dynamics of the data and the various layers of complexity as well as the multidimensional character of what was happening in one department.

The format of the case study provided intellectual space for the comprehensive description of the research situation (Merriam, 2000). My major drive as a participant researcher was to give an in-depth descriptive foundation and allow others to see and feel what I saw and felt, which prompted me to derive meanings from the data and articulate my
research claims. Having been immersed in the research setting for an extended period of
time, I might have omitted some significant details, which might have seemed natural,
requiring no extra explanation to me, but would not be so apparent to readers. I tried to
compensate for that by extending the level of detail and providing causal explanations that
reflected the depth of the electronic portfolio practice for multiple purposes in this
department.

**Locating Myself in the Research Process**

Etherington (2004) brought forth the idea of the researcher’s transformation that is intimately
linked to the research process. Etherington quoted Moustakas’s (1990) words that in
internalizing the data, understating their underlying dynamics, and discovering their
meanings, the researcher is ultimately awakening and transforming her own self. As the
researcher gets to know the data and research process intimately, she comes to understand her
own growth.

I was relying both on the data and myself to gain new insights and make new
connections. By being a participant researcher, I had to not only pay attention to what others
were telling and/or demonstrating to me, but also experience myself as a researcher,
electronic portfolio expert, and technology and faculty support person. Wearing multiple hats
and concerned with the collection of rich data, I became immersed in the situation so deeply,
that I had to question my ability to be objective and separate my understanding from the
perspectives of others. I had to refocus outside of myself (Etherington, 2004) by stepping
back from the complexity of this research situation and taking time for incubating new
understandings, recognizing new structures and themes, and articulating and making sense of
my data in the way that was unobscured by my immediate presence to the key participants
and/or events of this case study (Moustakas, 1990).

Coming back to grips with the literature on electronic portfolios as well as removing
myself from the research situation for a short time, I was able to both separate myself from
others and make a bridge between myself and others in order to explore my own identity in
relation to my multidimensional data. This separation helped to balance my objectivity and
subjectivity and remain in control of the research process (Etherington, 2004). Likewise, keeping a close focus on my research questions as I filtered through my data was another way to be in control and find myself in the research process.

Locating my place in this research has been both a daunting and rewarding task personally and professionally. The research process instilled a feeling of worthiness in me: I was part of an important endeavor, in which I was learning with and from my research participants, events, and data. Much like Moustakas’s (1990) stages that enable the researcher to explore the place of her inquiry in the research process, I passed through:

1. Initial engagement with the research topic, people, settings, and literature that allowed me to connect with and embrace the complex, intertwining, and multidimensional character of the research situation.

2. Immersion as I participated in the departmental events, became involved in formal and informal interactions with the FSHN faculty members and students, conducted semi-structured interviews, listened, analyzed, transcribed, and collected departmental documentation, all of which sharpened my research senses and opened up space for new interpretations.

3. As I was phasing into the incubation and illumination periods, I took the time to reflect on my data and new understandings. New themes, structures, and categories developed as I recognized commonalities within and across my data.

4. I then articulated my new understandings by writing numerous drafts of Chapter 4, talking to the key research participants and my research supervisor, who cautioned against too deep of an immersion and steered me towards a more objective stance that became apparent when I reconnected with the literature on electronic portfolios.

5. Finally, this work emerged as a synthesis of my data and the analytical approach of lateral and vertical iteration sifted through my personal knowledge, tacit awareness, and meaning making.

**Relationship of Research Findings to Prior Research**

The tension in portfolio development between support for learning, program assessment, and institutional accountability was prominently stated in the literature review in Chapter 2. The literature exposed the conflict between the assessment and reflective purposes of ePortfolios (Anderson & DeMeulle, 1998; Paulson & Paulson, 1996; Snyder et al., 1998). The research results of this case study further reveal that the tension is triggered by perceptual
differences of portfolio development in students and faculty as well as differences in their understandings of electronic portfolio purposes.

Perceptual differences and differences in student and faculty understandings of ePortfolio purposes were outlined in recent literature on electronic portfolios. Tosh, Light, Fleming and Haywood (2005) reported the student perspective for using electronic portfolios clashed with the ideas of faculty members. One student in this study summed up that the faculty promoting portfolio use were not connecting it to student needs, but rather selling the idea which, the student felt, was adding to his academic workload. Furthermore, the students were acutely aware of the necessity to showcase their performance as meeting prescribed standards and noted the imbalance between the amount of work required for the portfolio completion and the grade they received for it. Likewise, students in this study were concerned with receiving satisfactory grades for their electronic portfolios and speculated that grades would greatly impact the content and quality of the portfolio products.

Wetzel and Strudler (2006) reported that students and faculty members had different understanding of the electronic portfolio procedures, including:

1. unclear assessment criteria to evaluate student ePortfolios (in fact the larger the academic program implementing this practice was, the more likely evaluation criteria were to be modified over time);
2. inconsistent use of ePortfolios throughout student academic careers; and
3. last minute work on ePortfolios and requirements to submit polished artifacts.

These themes were particularly evident when Gregory, Sarah, and Megan spoke of their conceptualizations of ePortfolios as course assignments. Such portfolios were associated with the required production of course-mandated artifacts to demonstrate student attainment of course goals and objectives. All three student participants understood such portfolios as time-limited and noted that they required much work the night before they were supposed to be submitted. Sarah referred to her portfolio as time-consuming and did not plan to continue its development because she anticipated this practice would be used inconsistently in her later academic career.

Another parallel between Wetzel and Strudler’s (2006) research and this case study touches upon differences between student and faculty understandings of electronic portfolio
purposes. In this case study the students were torn between the two purposes of “filling out the portfolio and being done with it” and showcasing their uniqueness, skills, and knowledge, whereas the students interviewed by Wetzel and Strudler (2006) were frustrated by the lack of a clear purpose. The students were acutely aware of the need to demonstrate standards-based performances to attain state licensure and for the program to attain accreditation, but this purpose was obscured by inconsistent standards and rigor for evaluating the portfolios. In the present case study, the student participants saw electronic portfolios as mandated onto them and to be structured around academic standards and expectations, hence the attitude of “squeezing through the portfolio as just another assignment.” Sarah, in particular, felt that the mandate to include her class-related work in the electronic portfolio was not well rationalized by the instructor and viewed electronic portfolio development as a time consuming but inevitable requisite to “squeeze through.” In contrast, these student participants felt strongly about the purpose of showcasing their knowledge, skills, and inclinations.

The faculty participants in this case study closely connected the purpose of electronic portfolio to laying a foundation for a data-driven system to collect evidence of student achievement and attainment of learning outcomes. Penny and Kinslow (2006) described the portfolio discussion at Central University, where in preparation for an NCATE visit for accreditation in spring 2006, the administration articulated the need to use electronic portfolios for assessment and accountability in a way that was different from student-centered purposes.

Interestingly enough, unlike all of the above-referenced research, neither student nor faculty participants in this case study mentioned extreme frustration with technical issues. This may be explained by two factors:

1. The eDoc electronic portfolio system was owned by its users in the sense that faculty and students participated in the design and development of the eDoc FSHN electronic portfolio template before this research began. It was due to the student feedback that the Add Ability feature was introduced to depart from the fixed structure of the electronic portfolios. The students were more in control of the portfolio structure, although they occasionally were dissatisfied with the uniform look of the template.
2. The students and faculty in this case study received prompt technology support, both from the researcher and the eDoc programmer, who would work individually with each user to resolve the issues immediately upon receiving a cry for help.

Entrepreneurial activities (initiation of formal and informal departmental events, modeling of ePortfolio practice, and grant writing) of faculty members to promote sustainable use of electronic portfolios and leveraging the grassroots and administrative support were two other major outcomes of this case study. Wetzel and Strudler (2005) deliberated on the importance of involvement of all stakeholders to articulate a clear vision of the purpose and place of ePortfolios in teaching and learning that could only occur through the kind of leadership and governance in which the input of all faculty was valued.

A recent piece of literature on the impact of ePortfolios on learning (Becta, 2007) emphasized the urgency for a model of ePortfolio maturity by introducing descriptor sets to be used in authentic contexts by organizations and/or external evaluators. One example in the Becta report focused on the policy maturity set, whereby the organization moves from the absence of shared vision towards a clear and innovative shared policy and action plan to optimize portfolio integration.

In this case study, the pioneering faculty members shared their perspective of electronic portfolio practice for multiple purposes by initiating department-wide conversations on curriculum redesign and modeling the usage of this educational phenomenon. Grant writing was then seen as a driving force to help encourage wider use and sustain electronic portfolios. The grassroots movement ignited administrative support and brought the idea that student learning would flourish only under conditions whereby instructors, academic advisors, and administrators unite to clearly define the portfolio purposes and make sure that institutional assets do not take over student individual learning.

**Implications for Practice**

This case study brought forth several implications that were particularly evident in the practice of multipurpose electronic portfolios in the Department.

*Electronic portfolio development for multiple purposes calls for embedded curriculum.* This case study explicated the necessity to consistently infuse curriculum with electronic portfolio activities that ensured the continuity of the practice across academic
programs in this Department. The extent to which electronic portfolios were used program-wide impacted the way students and faculty members perceived the value of this educational phenomenon. Electronic portfolios implemented consistently from class to class were becoming more meaningful in the context of this particular Department and signaled that student learning was not treated as a mere institutional asset but rather these portfolios provided a comprehensive picture of student intrinsic motivation to become the very best for themselves. Rich, meaningful, and diverse student electronic portfolios might become sources to draw upon and assess individual courses, academic programs, and entire departments for coherency and transferability. When the electronic portfolio practice in this Department was consistently implemented and diffused across the curriculum, the academic community in the programs and department was forced to rigorously evaluate and re-evaluate standards and learning outcomes and make the process equitable.

Electronic portfolio development requires active participation of students, faculty members, administrators, and other stakeholders. This research elaborated on the way the tension of multipurpose electronic portfolio practice is expressed. This clearly indicated that students only benefitted from portfolio engagement when it was marked by the presence of intrinsic purpose that was relevant to student needs. These students believed in the potential of electronic portfolios to showcase their uniqueness but, trapped in the necessity to showcase their excellence, they began feeling disconnected from the process. If students were involved in the negotiation of portfolio policies, if their active participation was valued as much as faculty participation in the implementation process, the department might begin to consider ways in which the multiple purposes of support for learning, program assessment, and institutional accountability might be approached. Likewise, active participation of faculty, administrators, and other stakeholders would be an important ingredient for shaping embedded curriculum whereby students become acutely aware of each electronic portfolio submission that they make and its place in their mosaic of learning.

Electronic portfolios for multiple purposes require leveraging grassroots and administrative support. Support for electronic portfolio development in this case study stemmed from both enthusiastic faculty members and administrators. Faculty members were
instrumental in exposing the reflective, self-regulatory function of electronic portfolios and engaging students in organizing and managing their learning processes, whereas the administrator served to assure that careful planning and incremental portfolio implementation was in place.

Normally, electronic portfolio adoption begins with smaller steps (Becta, 2007; Strudler & Wetzel, 2005) and requires piloting and a gradual building of capacity that is possible only through both grassroots and administrative leadership. This implication is in line with the literature that suggests the combination of these two approaches for successful portfolio practice (Strudler & Wetzel 2005; Wade, Abrami, & Sclater, 2005).

Multiple purposes of electronic portfolios might be irreconcilable, but attention to these purposes helps to be conscious of student and faculty differences. Because the differences between the purposes of support for learning, program assessment, and institutional accountability are essentially philosophical differences between two different paradigms, positivist and constructivist (Paul & Paul, 1996), it might never be possible to truly reconcile them, because the differences are both philosophical and ethical. Instead, if these multiple purposes are clearly articulated and the tension between them is clearly understood, electronic portfolios can serve as an intersection of learning and accountability. Electronic portfolios may serve as formative assessment to support continuous learner improvement, while also providing data for analyzing institutional performance. Electronic portfolios can then be one of multiple measures of assessment. Combining multiple measures might help tell a richer story than a single measure. Lee Shulman (2007) wisely remarked that a natural component of student activity is to move from judgment to measurement and from interpretation to objectivity.

...as in any form of social inquiry the price of precision is narrowness of scope ... nearly any use of assessment for serious and policy guidance should intentionally employ an array of instruments that will constitute “union of insufficiencies.” It is dangerous to permit highly consequential decisions of policy and practice to rest on the results of a single instrument, however carefully it has been field-tested and ostensibly validated. (Shulman, p. 26))

Different stakeholders in the electronic portfolio process might have different explicit and implicit needs. Seeing electronic portfolios as another tool in a wide range of tools for
teaching and learning as well as another measurement of student success amongst multiples measures, we can begin to explicate the rationale for choosing this tool.

**Recommendations for Future Research**

This case study suggests that electronic portfolios practice for multiple purposes has much potential for further research. The suggestion that multiple purposes of electronic portfolios might be irreconcilable, but being conscious of those multiple purposes might help educators approach the difference between students, faculty, administrators, and other stakeholders constructively is very luring for future research. There is a need for longitudinal case studies with larger sample populations to examine ethical considerations behind the idea of institutions owning student ePortfolios and using them as a way to establish institutional reputation: As ePortfolios become institution centered and controlled, their reflective and learning functions are compromised. The case studies looking into the philosophical and ethical implications of the interactions of personal and institutional needs might have the potential to yield useful knowledge to help educators think constructively of using ePortfolios for teaching and learning.
APPENDIX A: REVIEWED KEY RESEARCH STUDIES ON TRADITIONAL (PAPER-BASED) AND ELECTRONIC PORTFOLIOS

(studies listed in alphabetical order)

Key to Contexts:
HE = higher education
TPD = teacher preparation and development
FD = faculty development

Key to Formats:
T = Theoretical inquiry: a theoretical review of literature or conceptual study for proposing new ideas in electronic portfolios.

ER = Experimental research: a study examining the effect of independent variable(s) on dependent variable(s).

CS = Case study: a study aimed at qualitatively investigating a single individual, group, program, or organization.

E = Evaluation research: a study aimed at determining the impact of a project, program, model, or software.

D = Developmental research: a study aimed at designing, developing, and evaluating an existing or newly developed model/process of portfolio use.

S = Survey research: a study addressing the distribution and return of responses in a nonexperimental situation.

Des = Descriptive study: a factually grounded study describing the portfolio practice.

C = Combination of inquiries: a study synthesizing two or more methodologies.
<table>
<thead>
<tr>
<th>Study’s author/ Traditional (T) or electronic (E) portfolios</th>
<th>Context</th>
<th>Topic</th>
<th>Format</th>
<th>Research findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anderson &amp; DeMeulle (1998) (T)</td>
<td>TPD</td>
<td>Pedagogical and theoretical assumptions&lt;br&gt;Portfolio uses: individual and institutional&lt;br&gt;Sustainability&lt;br&gt;What is the purpose of using portfolios in teacher education programs?&lt;br&gt;How has portfolio use impacted students?&lt;br&gt;How has portfolio use impacted teacher educators?&lt;br&gt;How has portfolio use impacted teacher education programs?&lt;br&gt;What issues are associated with using portfolios during practicum experiences?</td>
<td>S&lt;br&gt;N=22 universities and 13 states. Vancouver and the Netherlands also represented&lt;br&gt;Data sources: answers to open ended questions&lt;br&gt;Constant comparative method</td>
<td>Recognized purposes of using portfolios: to promote reflection, to facilitate learning, to assist in the job search and interview processes, to assume responsibility for learning.&lt;br&gt;Unrecognized purposes: no responses to explicitly state using portfolios to benefit teacher educators or teacher education programs.&lt;br&gt;Tensions: time, understanding of the portfolio concept, buy-in of all faculty, assessment tensions.&lt;br&gt;The full value of portfolios has not been explicitly recognized.</td>
</tr>
<tr>
<td>Avraamidou &amp; Zembal-Saul (2003)</td>
<td>TPD</td>
<td>Pedagogical and theoretical assumptions&lt;br&gt;Individual portfolio uses&lt;br&gt;How do electronic portfolios support prospective elementary teachers’ reflection?&lt;br&gt;How do electronic portfolios support the construction of their knowledge of learning and teaching sciences?&lt;br&gt;In what ways does the</td>
<td>CS&lt;br&gt;N=2 chosen on the assertion that they represent prospective teachers’ understanding of teaching science&lt;br&gt;Data sources: student Web-based portfolios, three versions of the Web-based science teaching philosophies included in the portfolios, student reflection statements&lt;br&gt;Pattern-matching, explanation-building, and time-series data</td>
<td>Electronic portfolios provided a place for connecting university coursework and field experiences, transforming from being descriptive to being explanatory, engaging in reflective and metacognitive activities, connecting physical engagement of children with conceptual aspects of learning, and focusing on teaching science as inquiry.&lt;br&gt;Technology proved useful in keeping multiple representations of teaching philosophies, taking advantage of the hypermedia component, and making thinking visible.</td>
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<td><strong>Borko, Michalec, Timmon, &amp; Siddle (1997)</strong>&lt;br&gt; (T)</td>
<td><strong>TPD</strong>&lt;br&gt; MA+ program at UC Denver where students earn certification and MA in elementary education in 2 years</td>
<td>Pedagogical and theoretical assumptions&lt;br&gt; Initiation&lt;br&gt; Sustainability&lt;br&gt; What factors facilitate and hinder the process of portfolio construction?&lt;br&gt; Impetus: to incorporate portfolios as a standard feature of the MA+ program</td>
<td>Action research&lt;br&gt; ( N = 21 ) (entire program cohort).&lt;br&gt; Data sources: written reflection from 21 students, structured interviews with 8 students&lt;br&gt; Analysis of set of categories or domains based on research questions and interviews, sorting responses into domains; narrative analysis</td>
<td>The majority of students viewed portfolios as a tool for reflection to link theoretic and practice.&lt;br&gt; Support from peers, CT, and instructor beneficial.&lt;br&gt; The hindrances – the status of portfolios as a course assignment, the restrictiveness of the portfolio guidelines, the emphasis on the reflection, and the timing of the assignment</td>
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<td><strong>Breault (2004)</strong>&lt;br&gt; (T)</td>
<td><strong>TPD</strong>&lt;br&gt; A 4-year undergraduate program, where 2 last years are devoted primarily to teacher education course work. Most students student teach during the spring semester of their final year.</td>
<td>Portfolio uses&lt;br&gt; Sustainability&lt;br&gt; What is the extend to which student teachers are able to demonstrate INTASC principles in their teaching as assessed through portfolios?&lt;br&gt; Faculty and students’ perceptions of portfolio experiences</td>
<td>CS&lt;br&gt; ( N = 10 ) student-volunteers, not a random sample, included a proportional balance of elementary and secondary majors, and male and female candidates, a variety of predicted ability levels (based on earlier field experiences and course work), and the ability to articulate their own thinking processes (based on faculty recommendations).&lt;br&gt; Data sources: 4 semi-structured individual interviews conducted with each participant, member-check.&lt;br&gt; Constant comparative procedure</td>
<td>This study identified inconsistency between university faculty and student teacher expectations and use of portfolio. The most prominent dissonance is in portfolio purpose, value, perception, and context.&lt;br&gt; Contributing factors: lack of clarity of stated portfolio purpose, the student teaching environment, and uncertainty between formative and summative nature of assessment.&lt;br&gt; Recommended: the purpose and meaningful ways of portfolio uses should be communicated to all the stakeholders early in the process; critique and experimentation should be integral to all course; a sense of teaching as a communal activity; committed and trained mentors; student teaching opportunities for planning lessons, not checking of what has been done; adequate time provision.</td>
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<td><strong>Cambridge &amp; Cambridge (2003)</strong>&lt;br&gt; (HE)</td>
<td>Theoretical and pedagogical assumptions&lt;br&gt; Portfolio uses&lt;br&gt; Technical maturity</td>
<td>T&lt;br&gt; N/A</td>
<td>Electronic portfolios herald an era of folio thinking which foregrounds realizations about the process and the context of learning. Electronic portfolios enhance the process and evince the context.&lt;br&gt; Five components of the future of electronic portfolio technology: design, semantics, factoring, community, and decentralization.</td>
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<td>Carney (2001)</td>
<td>TPD</td>
<td>Pedagogical and theoretical assumptions</td>
<td>CS</td>
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<td>(T) (E)</td>
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<td>Individual portfolio uses</td>
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<td>How do portfolios with their</td>
<td>N=6</td>
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<td>distinctive profile of technical</td>
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<td>and technological tools help</td>
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<td>preservice teachers think about</td>
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<td>and communicate their knowledge of</td>
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**Portfolios are a vehicle for documenting preservice teachers’ pedagogical content knowledge. Considerations of portfolio purposes and audiences are important.**

**Electronic portfolios offer greater potential for continuing professional development than traditional.**

**Portfolio dilemmas: multiple purpose, personal-revelation, cognitive overload, self-expression, dead-end (the lack of skills to author portfolios outside the portfolio system), and data aggregation.**

<table>
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<tr>
<th>Corwin (2005)</th>
<th>HE</th>
<th>Initiation</th>
<th>Des</th>
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<td>(E)</td>
<td></td>
<td>Large-scale implementation</td>
<td>N/A</td>
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<td>Sustainability</td>
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**Laptop computers provided to all faculty and students.**

**Computer basics sessions and portfolio demonstrations for freshmen. Various technology uses integrated into existing course. A one-credit senior portfolio seminar in portfolio development. Portfolio handbook and Website help available.**

**Students allowed to redeem their portfolio artifacts multiple times.**

**Portfolios archived on CDs, and stored in the university library. A university-wide Web-based tracking software to track student progress.**

**Faculty integrate portfolios into their course requirements and diversify student learning experiences with innovative teaching strategies.**

**Issues: a long planning period, late start on hardware and software training, balancing the portfolio prescriptiveness and the concept of a student-centered electronic portfolio, multiple purposes dilemma, the difficulty in measuring the impact of the electronic portfolio adoption on teaching and learning.**
<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Type</th>
<th>Pedagogical and theoretical assumptions</th>
<th>Case Study</th>
<th>CS</th>
<th>TPD/ER</th>
<th>Notes</th>
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<tr>
<td>Darling (2001)</td>
<td>T</td>
<td>TPD</td>
<td>The teacher education cohort of 31 students enrolled in a one-year program at the University of British Columbia. Portfolios used as a comprehensive assignment for assessment across courses through the two terms before the students departed for the practica.</td>
<td>Pedagogical and theoretical assumptions Individual uses of electronic portfolios What are teacher education students’ learning experiences with portfolios?</td>
<td>N=12 student-volunteers (4 men and 8 women) Data sources: video-recorded student presentations of their portfolios, no audience for the video sessions; interventions of researcher during student monologues only for clarification purposes. The interviews served as opportunities for students to revisit the portfolio processes after the extended school experience. The emerging themes structured into 4 categories: initial responses to the portfolio assignment, structural and stylistic approaches to construction, overarching themes students chose to address, metaphors represented in the final project.</td>
<td>Portfolios as an alternative way of assessment is a welcome departure from technical and mechanistic assessments. Most students perceived portfolios as a reflection on growth and discovery. For some students, portfolios remained random collections of undeveloped thoughts and ideas. Concerns: anxiety about the scope, nature and value of the portfolio task, lack of guidance in portfolio construction, little academic preparation, subjectivity of evaluation. Negotiating portfolio evaluative criteria with students, helping with structure and style, supporting theme exploration, and working with metaphors were beneficial.</td>
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<td>Gibson &amp; Barrett (2003)</td>
<td>E</td>
<td>N/A</td>
<td>Theoretical and pedagogical assumptions Portfolio uses Technical maturity What are the advantages and trade-offs of generic tools (GS) and customized systems (CS) if the goals of electronic portfolios are to stay focused on the quality of work by a learner and its valid alignment to the standards and goals of education? By what criteria can the two approaches be compared?</td>
<td>E</td>
<td>Which approach is better (GS or CS) is dependent upon the purpose and audience for the information contained in and connected to the portfolio. The best way is to combine both approaches with the purpose and audience in mind. Caution should be exercised in differentiating systems accountability issues from portfolio reviews, and feedback, individual expression from achievement, privacy from isolation of information. Appropriate use of both GT and CS contributes to the development of technological, critical and creative thinking skills.</td>
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<td>Green &amp; Smyser (1995)</td>
<td>T</td>
<td>TPD</td>
<td>Pedagogical and theoretical assumptions Individual portfolio uses</td>
<td>ER</td>
<td>Fall semester: n=32 (experimental group), n=36 (control group); Noticeable shifts in meanings given by students to the basic concepts of education occurred after the training in the use of electronic portfolios. Those</td>
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University, a large comprehensive, midwestern institution, and the University of Redlands, a small, private, liberal arts institution in Southern California

Did the use of teaching portfolios alter meanings that prospective teachers give to the concepts of teacher, student, classroom management, evaluation of teaching, professional growth, and reflective thinking?

Spring semester: \( n = 17 \) (experimental group), \( n = 20 \) (control group)

Data sources: pre-test and post-test responses

The semantic differential technique: six concepts with nine scales for each concept. The experimental group’s pre-test results were compared to the control group’s results by calculating mean values for each scale in the instrument.

guided in the preparation of teaching portfolios revealed better understanding of the value of the basic concepts of evaluation of teaching, professional growth, and reflective thinking.

Portfolio advantages as perceived by the participating students: self-assessment, organizing and documenting evidence of professional development, professional dialogues with peers and mentors, personal improvement.

Electronic portfolios can support student advisement, career preparation, credential documentation, the sharing of teaching philosophies and practices, department and program self-studies, and institutional and program accreditation processes. 
Electronic portfolio tools: homegrown electronic portfolio systems, open source, commercial, and common tools. 
Portfolio implementation issues: hardware and software, support and scalability, security and privacy, ownership and intellectual property, assessment, adoption, and long term maintenance. |
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<td>Implementation</td>
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<td>Technical maturity</td>
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Electronic portfolios can support student advisement, career preparation, credential documentation, the sharing of teaching philosophies and practices, department and program self-studies, and institutional and program accreditation processes. 
Electronic portfolio tools: homegrown electronic portfolio systems, open source, commercial, and common tools. 
Portfolio implementation issues: hardware and software, support and scalability, security and privacy, ownership and intellectual property, assessment, adoption, and long term maintenance. |
| Love, McKean, & Gathercoal (2004) (E) | HE | Portfolio uses | Initiation | T | 5 levels of portfolio maturation: Scrapbook, Curriculum Vitae, Curriculum Collaboration Between Student and Faculty, Mentoring Leading to Mastery, and Authentic Evidence as the Authoritative Evidence for Assessment, Evaluation, and Reporting. 
The highest level implies using Webfolios as tightly integrated collection of Web-based multimedia documents that could include curricular standards, student artifacts in response to assignments, and reviewer feedback of student work. Only a Webfolio is robust enough to support all five levels. |
<p>| | | Implementation | Implementation | N/A | |
| | | Sustainability | Sustainability | | |
| | | Technical maturity | Technical maturity | | |</p>
<table>
<thead>
<tr>
<th>McKinney (1998) (E)</th>
<th>TPD</th>
<th>The Preservice Elementary Teacher program at the University of Nevada, Las Vegas</th>
<th>Portfolio uses</th>
<th>Implementation</th>
<th>What do teachers in an undergraduate elementary teacher preparation program see as important about the process of constructing their own self-assessment portfolios?</th>
<th>C</th>
<th>$N=5$, who chose to construct electronic portfolios as a part of the The Collaborative Learning Instructional Methods Block (CLIMB) experimental cohort program requirements</th>
<th>Importance of constructing self-assessment portfolios: reflectivity, demonstrating growth over time to self and others, being in control of how to express the growth, connections between classes and field experiences, different than taking a test. The effects of technology: non-linear nature of electronic portfolios, easy to show connections, personalized ways of demonstrating learning, a possibility for being on the cutting edge of technology for job interviews, space limitations prompted selectivity. Dangers of electronic portfolios: encouraging “fluff” at the expense of content, stress, and frustration. Change over time and with experience: greater expertise, confidence and understanding of the purposes of portfolios and their potential. Reviewers found: “less focus on bells and whistles,” greater awareness of the needs of the viewers, shifting thinking to a nonlinear form, more experimentation, and the development of the professional voice. Support structures: access to technology, time, help from support staff, the support of the cohort. Impediments: time constrains, platform incompatibility, limited disk space, lack of access to technology. Benefits: for preservice teachers to step back and reflect on the progress; for the program: effectiveness and the evidence of the development of student professionalism.</th>
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<tr>
<td>Milman (2005) (E)</td>
<td>TPD</td>
<td>The preservice teacher education students participated in a one-credit course at a public school of education in the mid-</td>
<td>Pedagogical and theoretical assumptions</td>
<td>Individual portfolio uses</td>
<td>How did preservice teacher education students organize and create their electronic teaching portfolios?</td>
<td>C</td>
<td>$N=7$ students</td>
<td>Findings indicate that the process of creating electronic portfolio was constructivist, fostered self-confidence in students’ professional and technical skills. Portfolios perceived as marketing opportunities. The challenges of having little technical experience were outweighed by the advantages of</td>
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<tr>
<td>Author(s)</td>
<td>Context</td>
<td>Methodology</td>
<td>Findings</td>
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<td>Atlantic states.</td>
<td>What did they learn as a result of creating electronic portfolios? What are the advantages of www for such students to publish their portfolios?</td>
<td>mal questionnaire which used a Likert scale. Analytic induction, data managed, retrieved and stored with the qualitative data analysis program FolioViews</td>
<td>Sufficient technical resources, student and faculty commitment to portfolios are important.</td>
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<td>Norton-Meier (2003) (E)</td>
<td>TPD Teacher preparation program at Kansas State University</td>
<td>Pedagogical and theoretical assumptions Individual portfolio uses</td>
<td>The concept of efoliating – “...the peeling back of layers of learning and presenting it in an organized electronic format” (p. 518) Electronic portfolios allow for the creation of learners’ “...own sense of interconnectedness of those artifacts (work samples) while arriving at much richer understanding of themselves and the standards against which they are being measured”. (p. 517)</td>
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<td>Pecheone, Pigg Ghung, &amp; Souviney (2005) (E)</td>
<td>TPD Three University of California campuses, a pilot program to have teacher candidates complete and submit the PACT (Performance Assessment for California Teachers) portfolio through an electronic portfolio mechanism for credentialing.</td>
<td>Pedagogical and theoretical assumptions Implementation Sustainability Technical maturity What are the advantages and disadvantages of putting electronic portfolios? What are the potential pitfalls and unforeseen benefits of implementing electronic portfolio systems?</td>
<td>Submitting electronic portfolios is time-consuming, but slightly more or much more valuable than completing them on paper. 63% of supervisors preferred supervising portfolios electronically. Technical pluses: access from any computer via the Web, easier electronic scoring, saving all artifacts in the same location, standardized portfolio templates, multiple formats of information representation. Minuses: software update, format incompatibility, time consuming scoring, the trouble of viewing documents and video on old machines, incorrect screen sizes, bugs, resulting in user frustration.</td>
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<td>Piper (1999) (E)</td>
<td>TPD A small University Teacher Preparation Program. Multiple credential candidates enrolled in reading methodology</td>
<td>Pedagogical and theoretical assumptions Portfolio uses Sustainability To what extent does the electronic portfolio process</td>
<td>The processes of artifact collection, selection of the representative samples that best matched the course objectives, putting the evidence into the digital format, and writing a cover sheet that evaluated personal achievement enhanced self-assessment and self-reflection. Most students demonstrated that they were guided...</td>
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| Placier, Fitzgerald, & Hall (2001) | TPD  
The restructured teacher education program, where the implementation of portfolio assessment was one part of the complex, multi-level program restructuring process.  
The program first embraced traditional portfolios, then moved to an electronic format. | Pedagogical and theoretical assumptions  
Portfolio uses  
Implementation  
Sustainability  
Adaptation of a portfolio system for assessing preservice teachers’ development as reflective, inquiring, professionals. | C (E, CS)  
N=9 individual preservice teachers  
Dada sources – 10 interviews, fieldnotes from classroom and school observation, interviews with administrators and faculty (N not mentioned), reports, syllabi, assignments, and portfolios.  
Interviews conducted by researchers, who were not part of the teacher education program.  
Conceptual framework: the transformation of intentions in policy making processes, intentions for portfolio assessment in teacher education, and various stances portfolio writers take towards portfolios, transforming intentions. | by the course objectives throughout the electronic portfolio process and believed they were able to demonstrate achievement, competency, and proficiency in the course subject matter. One student indicated a preference for the traditional portfolio.  
Strengths: multimedia artifacts, possibility for creativity.  
Weaknesses: time, lack of technical experience, the necessity to work at school, cross-platform incompatibility, the absence of sufficient technical support. |
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<tr>
<th>Author(s)</th>
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<th>TPD</th>
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<tr>
<td>Ring (2002)</td>
<td>E</td>
<td>The Secondary Education Program in the College of Education</td>
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<tr>
<td>Schulman (1998)</td>
<td>T</td>
<td>Teacher Education Program at the University of California at Santa Barbara. A post-baccalaureate program provides an option of receiving a Master’s degree in conjunction with a teaching credential.</td>
</tr>
<tr>
<td>Snyder, Lippincott, &amp; Bower (1998)</td>
<td>T</td>
<td>Teacher Education Program at the University of California at Santa Barbara. A post-baccalaureate program provides an option of receiving a Master’s degree in conjunction with a teaching credential.</td>
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<tr>
<th>Pedagogical and theoretical assumptions</th>
<th>Implementation</th>
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<td>How does the Secondary Education Program impact the innovation effort, that is, the e-Portfolio Project?</td>
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<td>How do students exhibit professional growth when developing a portfolio in response to a set of the Accomplished Practices?</td>
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<td>In what ways do students’ illustrations change to include a variety of media as they develop their electronic portfolios over time?</td>
<td>N=25 student-volunteers</td>
</tr>
<tr>
<td>Data sources – student interviews, exit interviews, field notes, student portfolios, participant observation</td>
<td>Triangulation of data</td>
</tr>
</tbody>
</table>

The key factor in the electronic portfolio diffusion process is the involvement of all stakeholders. The quality of student portfolios reflects the level of faculty influence. The opportunity to engage in electronic portfolio reflective practice is essential to student professional development.

“Theory of teaching will determine a reasonable portfolio entry. What is declared worth documenting, worth reflecting on, what is deemed to be portfolio-worthy, is a theoretical act.” (p. 24)

Portfolio as a theoretical activity

The value of the portfolio processes is more related to reflection possibilities constructed over time than to the function or the audience of the portfolio

“Efforts to combine the dual purposes of support and accountability in portfolio development do not always result in a constructive tension. It appears that an essential element to using the tension constructively is the belief that a key ingredient in the process of learning from teaching is the...”
<table>
<thead>
<tr>
<th>Study</th>
<th>Methodology</th>
<th>Findings</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone (1998)</td>
<td>TPD Cohort teacher preparation program at California State University, Fresno</td>
<td>Portfolio uses Implementations Sustainability To what extent did students perceive portfolios as clearly communicating their learning and accomplishments during student teaching? To what extent did students perceive portfolios as a means to encourage reflection and learning about teaching? To what extent did students perceive the workshops and instruction provided as adequate to meet their needs? What problems did students have constructing their portfolios?</td>
<td>C Group 1 \text{n}=25 students, members of a school-based cohort (Cohort) Group 2 \text{n}=60 students, randomly selected from the regular teacher education program, not part of a cohort group (Mainstream) Data sources: questionnaires with closed and forced-choice questions for student and supervisors, semi-structured interviews with students and supervisors, Quantitative and qualitative ethnographic methods. Triangulation of data.</td>
</tr>
<tr>
<td>Strudler &amp; Wetzel (2005)</td>
<td>TPD Teacher education programs representing</td>
<td>Initiation Implementation</td>
<td>C (n=26) programs in 25 Universities in 15 US states, 1 Australian University</td>
</tr>
<tr>
<td>Van Sickle, Bogan, Kamen, Baird, &amp; Butcher (2005) (T) (E)</td>
<td>TPD, FD Teacher Preparation programs at four institutions in the Southeast region of USA</td>
<td>Theoretical and pedagogical assumptions</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Faculty dilemmas with student portfolios:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is professional judgment?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to manage the time involved with reading and evaluating a mass of materials?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Which materials to collect? At what intervals? Or what duration?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How materials are scored?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to mediate disagreements among faculty in judgment and methodology?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>N/A</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Faculty wishing to institute portfolios in preservice teacher assessment encounter the following dilemmas: variation in faculty members’ professional judgment and grading criteria, variations in defining the portfolio and its purpose, storage and archiving, differing opinions on grading policies and procedures, time required for the faculty to develop and come to consensus about the portfolio process, time required to evaluate and grade, variations between professors, programs and departments in the development and implementation, transferring between programs.

Student dilemmas: lack of clarity of the portfolio assignments, the requirement to be responsible for materials for 2–3 years, procrastination on completing a final portfolio submission and for job interviews, difficulty in getting quick faculty feedback, time and effort.

The same questions as posed by the faculty and students during the “early” years of integration of authentic and portfolio assessment.

“Portfolio assessment has not served to make learning for learning sake an intrinsic process. Student philosophy does not seem to have moved beyond the bottom line of grades.” (p. 505)
<table>
<thead>
<tr>
<th>Study</th>
<th>TPD Description</th>
<th>Pedagogical and theoretical assumptions</th>
<th>CS</th>
<th>Learning experiences of selecting artifacts, designing portfolios and presenting them to peers and faculty were beneficial to students. Students learnt from reflection, synthesis of their final products, and collaboration and interaction with others. Constraints of electronic portfolios: time, technical problems (losing files, lack of proper extensions to display artifacts, format incompatibility).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wang (2004) (E)</td>
<td>The Master’s program in Computer Education and Technology in a rural university in a small midwestern college town.</td>
<td>Individual portfolio uses</td>
<td>N=7 Master of Education students identified by the researcher based on the students’ decision to use electronic portfolios to demonstrate the attainment of ISTE goals. Data sources: sequential interviews, direct observation, and document analysis. Phenomenological approach</td>
<td></td>
</tr>
<tr>
<td>Wilkerson &amp; Lang (2003)</td>
<td>TPD</td>
<td>Do portfolios have a place in teacher training and certification?</td>
<td>T</td>
<td></td>
</tr>
<tr>
<td>Wilson, Wright, &amp; Stallworth (2003) (E)</td>
<td>TPD</td>
<td>Individual portfolio uses</td>
<td>C</td>
<td>Student perception of the value of electronic portfolios as an employment tool and a product rather than a process of their own and future students’ learning. Few students mentioned implementing electronic portfolios in their own classrooms. Concerns about electronic portfolios: little reflection and critique of students pedagogical skills and experiences; the tensions between electronic portfolio purposes.</td>
</tr>
<tr>
<td></td>
<td>The secondary preservice majors (foreign language, language arts, mathematics, science, social studies) enrolled in the “secondary method block” (4 courses: content methods, content area literacy, clinical experiences, and test and measurement)</td>
<td>What were the preservice teachers’ perceptions of the electronic portfolio processes at the beginning and end of the methods semester?</td>
<td>T=111</td>
<td></td>
</tr>
</tbody>
</table>
| Wright & Stallworth (2002) (E) | TPD Methods blocks for preservice teachers | Pedagogical and theoretical assumptions  
Individual portfolio uses  
Implementation  
The challenges of electronics portfolios as perceived and experienced by the preservice students | C (S, E)  
N=25 student-volunteers in the pretest survey, N=23 surveyed in the posttest period  
Data sources: written feedback to pretest and posttest surveys, analysis of student electronic portfolios, consisting of Web sites, digitally edited teaching episodes, databases, concept maps, etc.  
Constant comparative method | Implementing electronic portfolios requires time, commitment, extensive planning, and ongoing evaluation.  
While most student internalized electronic portfolios, few indicated that portfolios assignments were not presented clearly and technologies were not readily available. |
## APPENDIX B: THE COLLEGE OF HUMAN SCIENCES AND FSHN
### DEPARTMENT GENERAL LEARNING OUTCOMES

<table>
<thead>
<tr>
<th>College Outcomes</th>
<th>FSHN Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>• Be able to speak and write clearly and persuasively</td>
<td>C.1. Communicate effectively with others in one-on-one, small group, and large-group situations.</td>
</tr>
<tr>
<td>• Demonstrate the skills necessary to prepare effective visual presentations</td>
<td>C.2. Prepare and deliver effective presentations (orally and in writing) of technical information to food science and nutrition professionals.</td>
</tr>
<tr>
<td>• Be able to receive information effectively through reading, listening and observation</td>
<td>C.3. Prepare and deliver effective presentations (orally and in writing) of technical information to the general public.</td>
</tr>
<tr>
<td><strong>Critical Thinking and Problem Solving</strong></td>
<td></td>
</tr>
<tr>
<td>• Be able to work effectively with others on complex, issue-laden problems requiring holistic problem-solving approaches</td>
<td>P.1. Successfully solve multidisciplinary problems as part of a team.</td>
</tr>
<tr>
<td>• Demonstrate an ability to:</td>
<td>P.2. Successfully solve complex problems on your own.</td>
</tr>
<tr>
<td>o distinguish verifiable facts from value claims</td>
<td>P.3. Locate and accurately interpret current research literature.</td>
</tr>
<tr>
<td>o determine the accuracy of statements</td>
<td>P.4. Summarize and accurately interpret data generated by yourself and others.</td>
</tr>
<tr>
<td>o identify assumptions and detect bias</td>
<td>P.5. Critically evaluate information on food science and nutrition issues appearing in the popular press. This includes distinguishing facts from claims, detecting bias, identifying sources of conflict, and evaluating assumptions</td>
</tr>
<tr>
<td>o distinguish relevant from irrelevant information</td>
<td></td>
</tr>
<tr>
<td>o prioritize needs</td>
<td></td>
</tr>
<tr>
<td>• Be able to summarize, analyze, and interpret simple research data.</td>
<td></td>
</tr>
<tr>
<td><strong>Ethics, Environmental Awareness, International/Multicultural Awareness</strong></td>
<td></td>
</tr>
<tr>
<td>• Develop an ethical perspective and sense of moral responsibility and values</td>
<td>S.1. Conscientiously apply your profession's code of ethics in your work</td>
</tr>
<tr>
<td>• Be able to discuss contemporary ethical and moral issues in professional and private life</td>
<td>S.2. Discuss the social, multicultural, and environmental dimensions of issues facing professionals in your field.</td>
</tr>
<tr>
<td>• Be able to critically evaluate their own arguments and those of others</td>
<td></td>
</tr>
</tbody>
</table>
• Understand the physical and biological properties of the environment and how these properties are interlinked within ecological systems
• Understand how human activities, such as modern agricultural practices, impact on the environment and how societies are affected by environmental change
• Have an awareness and understanding of cultural diversity within our own nation and around the world
• Develop a global perspective on agricultural, environmental, economic, and natural resource issues
APPENDIX C: THE WORKING DOCUMENT:
FSHN DEPARTMENT OUTCOMES, REQUIRED COURSES AND
MANDATED PORTFOLIO ASSIGNMENTS

This table specifies the general nature of the artifacts used to demonstrate outcome achievement for each of FSHN Department outcomes for specified courses (courses that devote a major amount of time towards achievement of this outcome).

Syllabi for the specified courses contain:
1. course outcomes related to specified department outcomes
2. a detailed description of the nature of the artifacts/assignment(s)
3. a detailed description of how the students’ work on that (those) assignments will be evaluated.

<table>
<thead>
<tr>
<th>Department Outcomes</th>
<th>Courses required for specific FSHN majors used to meet department outcomes and Artifacts &amp; evaluation strategies used to demonstrate outcome achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN graduates will be able to:</td>
<td>Dietetics</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C. 1. Communicate effectively with others in one-on-one, small-group, and large-group situations.</strong></td>
<td>FSHN 110</td>
</tr>
<tr>
<td></td>
<td>-Professional interview paper</td>
</tr>
<tr>
<td></td>
<td>-Written self-reflection</td>
</tr>
<tr>
<td></td>
<td>-Instructor evaluation</td>
</tr>
<tr>
<td></td>
<td>FSHN 214</td>
</tr>
<tr>
<td></td>
<td>-Food prod oral presentation</td>
</tr>
<tr>
<td></td>
<td>-Instructor evaluation rubric</td>
</tr>
<tr>
<td></td>
<td>-Written self-reflection</td>
</tr>
<tr>
<td></td>
<td>FSHN 466</td>
</tr>
<tr>
<td></td>
<td>-Counseling Project reports</td>
</tr>
<tr>
<td></td>
<td>-Written self-reflection</td>
</tr>
<tr>
<td></td>
<td>-Instructor evaluation</td>
</tr>
<tr>
<td></td>
<td>FSHN 472</td>
</tr>
<tr>
<td></td>
<td>-Oral presentation videotape</td>
</tr>
<tr>
<td></td>
<td>-Instructor evaluation</td>
</tr>
</tbody>
</table>


### C. 2. Prepare and deliver effective presentations (orally and in writing) of technical information to food science and nutrition professionals.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 360</td>
<td>Original research papers</td>
<td>FSHN 361 -Written assign -Oral presentation</td>
</tr>
<tr>
<td></td>
<td>FSHN 463 -Proposal Project Written &amp; Oral Reports -Instructor evaluation of both -Peer evaluation of oral</td>
<td>FSHN 421 -Lab book -Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 480</td>
<td>Oral (video tape) &amp; written research reports -Self-evaluation -Peer evaluation -Instructor evaluation</td>
<td>FSHN 480 -Lab book -Instructor evaluation</td>
</tr>
</tbody>
</table>

### C. 3. Prepare and deliver effective presentations (orally and in writing) of technical information to the general public.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 480</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Critical Thinking and Problem Solving (P)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 403</td>
<td>Group assignments</td>
<td>FSHN 403 -Group assignments</td>
</tr>
<tr>
<td></td>
<td>FSHN 405 -Industry case problems -Written self evaluation -Written instructor evaluation -Written TA evaluation -Written peer evaluation</td>
<td>FSHN 405 -Industry case problems -Written self evaluation -Written instructor evaluation -Written TA evaluation -Written peer evaluation</td>
</tr>
<tr>
<td>FSHN 411</td>
<td>Team research project</td>
<td>FSHN 412 -Product Development Project</td>
</tr>
<tr>
<td>FSHN 461 &amp; 464</td>
<td>Case study presentation visuals -Instructor evaluations</td>
<td>FSHN 421 -Product Development Project</td>
</tr>
</tbody>
</table>

### P. 1. Successfully solve multi-disciplinary problems as part of a team.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 311</td>
<td>Team lab research project</td>
<td>FSHN 311 -Team lab research project</td>
</tr>
<tr>
<td>FSHN 403</td>
<td>Group assignments</td>
<td>FSHN 403 -Group assignments</td>
</tr>
<tr>
<td>FSHN 405</td>
<td>Industry case problems -Written self evaluation -Written instructor evaluation -Written TA evaluation -Written peer evaluation</td>
<td>FSHN 405 -Industry case problems -Written self evaluation -Written instructor evaluation -Written TA evaluation -Written peer evaluation</td>
</tr>
<tr>
<td>FSHN 411</td>
<td>Team research project</td>
<td>FSHN 412 -Product Development Project</td>
</tr>
<tr>
<td>FSHN 419(opt.)</td>
<td>Toxic doses calculation activities -Food safety debate presentation</td>
<td>FSHN 421 -Product Development Project</td>
</tr>
<tr>
<td>FSHN 461 &amp; 464</td>
<td>Case study presentation visuals -Instructor evaluations</td>
<td>FSHN 461 &amp; 464 (opt.) -Case study presentation visuals -Instructor evaluations</td>
</tr>
</tbody>
</table>
### P. 2. Successfully solve complex problems on your own.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 167</td>
<td>Nutrition Assessment paper</td>
<td>FSHN 167 - Nutrition Assessment paper</td>
</tr>
<tr>
<td>FSHN 261</td>
<td>Homework/ Exam Nutrition Prob - Instructor evaluation</td>
<td>FSHN 261 - Homework/ Exam Nutrition Prob - Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 410</td>
<td>Ind. Food Analysis Project</td>
<td>FSHN 410 - Food-borne disease case study report - Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 420</td>
<td>- Food-borne disease case study report - Instructor evaluation</td>
<td>FSHN 420 - Food-borne disease case study report - Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 421</td>
<td>- Written individual diet assign. - Instructor evaluations</td>
<td>FSHN 421 - Written individual diet assign. - Instructor evaluations</td>
</tr>
<tr>
<td>FSHN 461 &amp; 464</td>
<td>- Written individual diet assign. - Instructor evaluations</td>
<td>FSHN 461 &amp; 464 (opt.) - Written individual diet assign. - Instructor evaluations</td>
</tr>
</tbody>
</table>

### P. 3. Locate and accurately interpret current research literature.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 261</td>
<td>Research paper - Instructor evaluation</td>
<td>FSHN 261 - Research paper - Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 360</td>
<td>Original Research Papers</td>
<td>FSHN 360 - Original Research Papers</td>
</tr>
<tr>
<td>FSHN 362</td>
<td>Scientific research topic search</td>
<td>FSHN 362 - Scientific research topic search</td>
</tr>
<tr>
<td>FSHN 480</td>
<td>- Oral (video tape) &amp; written research reports - Self-evaluation - Peer evaluation - Instructor evaluation</td>
<td>FSHN 480 - Oral (video tape) &amp; written research reports - Self-evaluation - Peer evaluation - Instructor evaluation</td>
</tr>
</tbody>
</table>

### P. 4. Summarize and accurately interpret data generated by yourself or others.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 311</td>
<td>- Weekly lab exp. data analysis - Team Research Project</td>
<td>FSHN 311 - Weekly lab exp. data analysis - Team Research Project</td>
</tr>
<tr>
<td>FSHN 460</td>
<td>- Lab reports - Instructor evaluation</td>
<td>FSHN 460 - Lab reports - Instructor evaluation</td>
</tr>
<tr>
<td>FSHN 421</td>
<td>- Research proposal &amp; paper</td>
<td>FSHN 421 - Research proposal &amp; paper</td>
</tr>
<tr>
<td>FSHN 411</td>
<td>- Research proposal &amp; paper</td>
<td>FSHN 411 - Research proposal &amp; paper</td>
</tr>
<tr>
<td>FSHN 406</td>
<td>- Team Research Project</td>
<td>FSHN 406 - Team Research Project</td>
</tr>
<tr>
<td>FSHN 472</td>
<td>- Instructor evaluation</td>
<td>FSHN 472 - Instructor evaluation</td>
</tr>
</tbody>
</table>
**P. 5.** Critically evaluate information on food science and nutrition issues appearing in the popular press. This includes distinguishing facts from claims, detecting bias, identifying sources of conflict, and evaluating assumptions.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 203</td>
<td>Current topics evaluation oral and written report</td>
<td></td>
</tr>
<tr>
<td>FSHN 203</td>
<td>Current topics evaluation oral and written reports</td>
<td></td>
</tr>
<tr>
<td>FSHN 420</td>
<td>Popular news article oral report</td>
<td></td>
</tr>
</tbody>
</table>

**Social Concerns and Ethics (S)**

**S. 1.** Conscientiously apply your profession's code of ethics in your work.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 203</td>
<td>Prof ethics evaluation oral and written reports</td>
<td></td>
</tr>
<tr>
<td>FSHN 340</td>
<td>ADA Ethics Code written assign</td>
<td></td>
</tr>
</tbody>
</table>

**S. 2.** Discuss the social, multicultural, and environmental dimensions of issues facing professionals in your field.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSHN 342</td>
<td>Bihari Farmer Assignment</td>
<td></td>
</tr>
</tbody>
</table>

**Technical Skills (T)**

**T. 1.** Demonstrate a high level of technical competence in your field of study, so that you can perform successfully in a graduate program, supervised practice program, or entry-level professional position.
APPENDIX D: EXAMPLES OF SEMI-STRUCTURED INTERVIEW QUESTIONS

Individual Semi-Structured Interview with Faculty/Staff Members

Interviewer: Lesya M. Hassall

Date:

Potential questions:

1) What were the purposes of the student electronic portfolio in this course?

   Probe:

   a) How does this electronic portfolio relate to student learning?
   b) How does this electronic portfolio relate to the course you taught?
   c) How does this electronic portfolio relate to the accreditation requirements?

2) Why did you decide to introduce electronic portfolios to students in your course?

3) Please, explain the structure of this portfolio. How did you introduce the portfolio structure to your students?

4) Show an artifact(s) from this course included in the student electronic portfolio. Please, tell how this artifact was identified for inclusion.

   Probe:

   a) Tell how the artifact(s) could/might support this student’s learning.
   b) Tell how the artifact(s) could/might be used for improving this course.
   c) Tell how the artifact(s) could/might be used for accreditation.

5) Show a reflection(s) for this artifact(s). In your opinion, what did it add to this student’s electronic portfolio?

6) Is this electronic portfolio representative of its student owner (her experiences, knowledge, abilities, and skills)? Please, refer to specific artifacts in answering this question.

7) The student used the “Add ability” feature of the electronic portfolio. In your opinion, what did it bring to this electronic portfolio?
8) Show and tell about an artifact(s) in this electronic portfolio that in your opinion lacks quality, but could potentially become better after receiving feedback from you and student peers.

 Probe:
   a) In your opinion, is it beneficial to include such unpolished artifacts in the electronic portfolios?
   b) Whose feedback is of utmost value to the electronic portfolio owner?

9) What feedback from you did this student receive on her electronic portfolio? How was it different because of the electronic portfolio?

10) In your opinion what aspect of electronic portfolio development is most and least valuable?

 Probe:
   a) What aspect of electronic portfolio development is most and least valuable to this student?
   b) What aspect of electronic portfolio development is most and least valuable to this course?
   c) What aspect of electronic portfolio development is most and least valuable to the Department?


 Probe:
   a) Would you recommend using electronic portfolios to other faculty in the Department?

12) Do you have any additional comments?

 Thank you for your participation!
Individual Semi-Structured Interview with Associate Department Chair

Interviewer: Lesya M. Hassall

Date:

Potential questions:

1) How does your Department use electronic portfolios?

   Probe:
   
a) How does the Department use electronic portfolios to support learning?
   b) How does the Department use electronic portfolios to support program assessment?
   c) How does the Department use electronic portfolios to support institutional accountability?

2) Why did your Department decide to use electronic portfolios?

   Probe:
   
a) How do electronic portfolios tie with the organizational culture of your Department?

3) Please, explain how your Department identified artifacts to be included in electronic portfolios.

   Probe:
   
a) Tell about an artifact(s) your Department could/might use to enhance student learning.
   b) Tell about an artifact(s) your Department could/might use for program improvement.
   c) Tell about an artifact(s) your Department could/might use for accreditation.

4) What changes if any did electronic portfolios bring to your Department?

5) What are the current challenges of electronic portfolios that the Department faces?

6) How does the Department support and encourage the usage of electronic portfolios?

7) What are the Department’s concerns about the future of electronic portfolios?

8) What additional comments do you have?

Thank you for your participation
Student Semi-Structured Interview

**Interviewer:** Lesya M. Hassall  
**Date:**

1) What was the purpose of the electronic portfolio you created during your freshmen year?

   *Probe:*
   
   a) *How does your electronic portfolio relate to your learning?*
   
   b) *How does your electronic portfolio relate to the courses you took in your freshman year?*
   
   c) *How does your electronic portfolio relate to the accreditation requirements?*

2) How did you select artifacts for your electronic portfolio? Please refer to each artifact when you answer this question.

3) How is your electronic portfolio representative of your knowledge, skills or/and competencies? In answering this question, please refer to specific artifacts included in your portfolio.

4) You used the “Add ability” feature of your electronic portfolio. Please, explain it.

5) Show me an artifact(s) that lacked quality, but you decided to include in your electronic portfolio, because it could potentially become better after receiving feedback from faculty and peers. Tell me about it.

   *Probe:*
   
   a) *Whose feedback did you find most beneficial?*

6) Show me where you reflected on your electronic portfolio. In your opinion, what did your reflections add? How do you feel about your reflection?

7) In your opinion, who will find your electronic portfolio useful? Please, explain your answer.

   *Probe:*
   
   a) *Show and tell me about an aspect of your electronic portfolio you learned from.*
   
   b) *Show and tell me about an aspect of your electronic portfolio that might be useful for others. Why would it be useful and to whom?*
c) *How do you feel about your portfolio?*

8) What and why was the most cumbersome part of working with your electronic portfolio?

9) Do you expect to use this portfolio in your other classes?

10) Do you have any additional comments?

11) What motivated you to become part of this research?

*Thank you for your participation!*
APPENDIX E: AN ENTRANCE TO THE PASSWORD-PROTECTED ONLINE ARTIFACTS AND EVALUATION STRATEGIES GRID (CAPTURED ON 5/18/07)

### Departmental Outcomes Assessment by Majors and Courses

#### Communicate effectively with others in one-on-one, small-group, and large-group situations.

<table>
<thead>
<tr>
<th>Department Outcomes</th>
<th>Courses required for FSHN majors used to meet department outcomes.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dietetics</td>
</tr>
<tr>
<td>FSHN 110</td>
<td>FSHN 110 (Same)</td>
</tr>
<tr>
<td>Assignment - professional interview</td>
<td>Evaluation - self-reflection - instructor</td>
</tr>
<tr>
<td>FSHN 214</td>
<td>FSHN 466 (cpt w/463) (Same)</td>
</tr>
<tr>
<td>Assignment - food product presentation</td>
<td>Evaluation - self-reflection - instructor</td>
</tr>
</tbody>
</table>
APPENDIX F: AN EXAMPLE OF A PORTFOLIO ASSIGNMENT:
FSHN 110 IN THE FALL SEMESTER OF 2006

Writing Reflections
FS HN 110

Artifact title: ____________________________

Context: What purpose and in what setting was this artifact created?

Rationale: Why did I select this artifact to include in my portfolio?

Reflection: What does this artifact show about my knowledge and skills in this area? What did I learn from the experience that resulted in this artifact?
APPENDIX G: AN EXAMPLE OF A PORTFOLIO ASSIGNMENT:
FSHN 340 IN THE FALL SEMESTER OF 2006

**Portfolio assignment:** The purpose of this assignment is help you begin the process of “proof of learning” as a professional. You will display examples of your work, talents, and achievements in your electronic portfolio. You will take the portfolio with you to job interviews and use it to discuss information in your resume in more detail (in fact, a recent internship graduate nailed the job of her dreams by showing her portfolio to a prospective employer!).

This portfolio will not be complete in any way—this is just a beginning! Be sure to include a brief explanation blurb for any materials that aren't self-explanatory. Here are ideas of what you might include:

- Your resume (1st page) and your mission statement and goals.
- The grant you will write in FSHN 463.
- The projects you will complete in FSHN 466 and FSHN 411.
- Information showing your involvement in the campus or your local community (maybe a newspaper clipping, maybe a letter of thanks for volunteering).
- Copies of any awards you might receive.
- Photos of displays you create.

This will not be a finished product—this is a beginning! You will continue using the e-portfolio that you started in FSHN 110. Most likely you will be required to keep a portfolio in your dietetic internship and you will be required to keep a portfolio once you begin working your career as an RD.
Ideas for your portfolio are found in the book: “Creating your Career Portfolio” (Williams and Hall). This book is loaned to you and you are required to return the book when you turn in your portfolio.

Your portfolio will be reviewed and critiqued by a classmate and by the instructor. The evaluation tool and rubric are found on Classweb.

The e-portfolio address is: http://portal.iastate.edu. Please provide access to your instructor by using the Share your Portfolio function.
REFERENCES


Amsterdam, The Netherlands: Elsevier.


Reitmeier, C. (2006, Fall). Improvement of student learning: Portfolios, artifacts, and your annual review. Presentation delivered to Department of Food Science and Human Nutrition teaching faculty, Ames, IA.


