

Examining the Role of Reflection in ePortfolios: A Case Study

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Extended institutional experience with ePortfolios grounded and framed this qualitative case study guided by the research question: Why, how, and with what success is reflection, as a teaching/learning process, employed among ePortfolio projects at Indiana University–Purdue University Indianapolis (IUPUI)? Thirty-two representatives of 16 varied ePortfolio projects in degree programs, campus-wide high-impact practices, and single courses participated in 27 hour-long, face-to-face, semi-structured interviews and provided supplemental documents for review. Qualitative data analysis software enabled collaborative data coding and analysis. Researchers adopted procedures to support reliability, trustworthiness, and transferability of findings throughout the research process. The nine findings cut across stereotypical ePortfolio distinctions, revealing widely shared purposes, practices, successes, and frustrations with reflection in ePortfolios. Reflection was seldom the primary motivator for ePortfolio adoption, but its importance was quickly recognized and valued. Students' limited abilities to reflect typically surprised their instructors, who then pursued a range of strategies to help students improve their reflection skills. Faculty and student understandings of reflection had multifaceted effects on ePortfolio practice and experience. Though not easy to achieve, effective reflection practice appeared to be multi-dimensional and rewarding for students and instructors alike.

The ePortfolio community has identified the need for research to enhance understanding of “the ways in which ePortfolio practices and pedagogies can effectively facilitate meaningful reflection and feedback, two strategies which have already been empirically linked to learning” (Watson, 2012, p. 3969). Reflection has long been viewed as a cornerstone of most ePortfolio practice in higher education, whether for supporting learners in making connections among learning experiences or for enabling authentic assessment of learning within programs.

At Indiana University-Purdue University Indianapolis (IUPUI), departments, courses, and campus-wide centers for coordinating high-impact practices have implemented a variety of ePortfolio projects serving a wide range of purposes. Most projects have included reflection as part of the ePortfolio development process. Looking ahead to the next stages of our campus ePortfolio Initiative, campus leaders participated in Cohort VI of the Inter/National Coalition for Electronic Portfolio Research (I/NCEPR), anticipating a focus on using electronic portfolios for assessment and accreditation. Cohort readings and discussions around the relationship between evidence and reflection shifted our interest to the ways in which reflection contributed to success in meeting varied ePortfolio projects' goals. This article summarizes the research and findings of the resulting qualitative research project conducted October 2011 through September 2014.

Related Literature

Reflection

Reflective practices to enhance teaching and learning in higher education have been designed,

implemented, and reported successfully across a range of fields and settings; however, there is no common definition of or approach to reflection. Rogers (2001) conducted a meta-analysis of seven “major theoretical approaches to reflection” (p. 37) that included a majority of well-known theorists: Boud, Keough, and Walker; Dewey; Langer; Loughran; Mezirow; Schön; and Seibert and Daudelin. His analysis informed this research study, as it offered a broad view of “commonalities in terminology, definitions, antecedents, context, processes, outcomes, and techniques to foster reflection” (p. 37).

Rogers's seven theoretical approaches produced 15 different terms to describe reflection. Rogers (2001) noted that this variability is symptomatic of general usage, where the word reflection is used “as a noun, a verb, an adjective, a process, and/or an outcome; consequently, it is difficult to determine what is intended when reflection in teaching and learning is discussed” (p. 40). He found greater agreement among the seven with respect to the defining elements of reflection:

a cognitive and affective process or activity that (1) requires active engagement on the part of the individual; (2) is triggered by an unusual or perplexing situation or experience; (3) involves examining one's own responses, beliefs, and premises in light of the situation at hand; and (4) results in integration of the new understanding into one's experience. (p. 41)

Depending on the particular theorist's understanding of reflection, Rogers (2001) observed

that reflection was often presented in phases or steps. Most theorists held that the process was iterative; reflection began with problem identification and the commitment to seek a solution, next searched for information to support a decision, and, finally, resulted in action. Key antecedents and contextual factors contributed to successful reflection. The two main antecedents included a trigger incident and an “individual’s readiness and willingness to engage in the reflective process” (Rogers, 2001, p. 42). The ideal context was carefully prepared in order to balance challenge with support for learners. While their techniques for fostering reflection varied, theorists agreed overall that guided reflection helped students achieve expected outcomes of “learning and enhanced personal and professional effectiveness” (Rogers, 2001, p. 55).

Electronic Portfolio

As with reflection, definitions of eportfolios vary widely, ranging from “compilation of best practices . . . to a fluid product meant to demonstrate progress as well as achievement” (Pitts & Ruggirello, 2012, p. 49). Current ePortfolio practices in higher education are similarly varied, usually involving “instruction, assessment, and professional development” (Watson, 2012, p. 3969), singly or in some combination. As Chen and Penny Light (2010) noted, purposes for using portfolios are driven not only by learning objectives but also by the needs and interests of stakeholders. Despite this variability, however, Brown, Chen, and Gordon (2012) confirmed, in an analysis of the 2012 AAEEBL Survey, an emerging agreement that ePortfolios spur change in the way instructors think about teaching and learning as they come to understand that “the more the learner takes charge of the format and process, the deeper the learning” (Cambridge, 2010, p. 2) and the greater the opportunity for knowledge connection and integration (Chen & Penny Light, 2010).

ePortfolios can also reveal students’ educational journey across what Yancey (2004) referred to as the multiple curricula of higher education: the *delivered* curriculum of the classroom, the *experienced* curriculum as students receive and practice the delivered curriculum, and the *lived* curriculum as students learn over time from all sources in and beyond the classroom. ePortfolios afford structured time and space for learners to understand and voice their experiences with guidance from their instructors.

Banta (2003) observed that “in addition to their usefulness in assessing student learning and development over time, portfolios can also play a role in assessing the effectiveness of courses, curricula, and even institutions” (p. 4). Many ePortfolio adopters have emphasized evaluation, assessment, or accreditation

because of the authenticity and complexity that a collection of student work over time can capture. Some practitioners use rubrics aligned with learning outcomes to communicate expectations to learners, distinguish levels of competence, and support reliability of assessments: “When utilized with student work collected in e-portfolios, rubrics provide a robust framework for assessing the many dimensions of learning through and across the curriculum and cocurriculum and over time” (Chen & Penny Light, 2010, p. 19).

Walvoord (2010) proposed key assessment practices for successful institution-wide ePortfolio implementation. Students need guidance on collecting and reflecting on artifacts, along with feedback and support to help them see the value of ePortfolio development. Focusing on improved student learning purposes could help ePortfolio proponents address the concerns of skeptical colleagues.

Beyond supplementing traditional job-seeking materials, ePortfolios can also support students’ development of professional and civic identity, as Cambridge (2010) observed:

When deeply integrated into and across the curriculum and co-curriculum, eportfolios go far beyond an enhanced resume or transcript. They can help students develop abilities essential to long-term success: the strategies and confidence to learn independently; the understanding of one’s own strengths and predilections to allow for more effective collaboration; and the reflective linking of values and aspiration with knowledge and action to enable charting career trajectories and fulfilling responsibilities as a citizen. (p. 52)

Moon (2004) similarly argued that reflection is an “essential basis for good quality (meaningful) learning” (para. 5) which, in turn, “underpins other aspects of employability” (5. para. 1) captured on employer surveys. She underscored the need for a framework such as ePortfolio to make the process of reflective learning, including transferable skills, both intentional and visible to potential employers.

Reflection and ePortfolio

No matter the original purpose for an ePortfolio project, evidence reveals a role for reflection. In addition to supporting learning outcomes or other goals, “reflective practices allow students to provide additional information on attitudes and the affective side of learning, while also encouraging consideration of the relevance and transfer of experiences and skills from one domain to another” (Chen & Penny Light,

2010, p. 13). Zubizarreta (2009) considered reflection a “crucial element” of a learning portfolio.

Reporting on I/NCEPR research on whether claims for the value of reflection in ePortfolio practice could be substantiated, Yancey (2009) concluded that “the relationship between eportfolios, structure, and reflection” (p. 7) confirmed “that established or student-created structures invite, foster, and support reflection” (p. 8). In turn, “the efficacy of eportfolio-reflective practice on students” (pp. 7-8) showed that “eportfolio reflection, as defined here, is directly related to student success” (p. 12). The research also articulated “a set of claims—and new questions emanating from them—about the materials, contexts, and practices of a new kind of reflection that students are inventing in eportfolio environments” (p. 8). The last set of findings also suggested the need for additional research into the materials of reflection, since ePortfolios created opportunities for reflection to be expressed in many forms beyond the traditionally accepted “writing as corollary to thinking and learning” (Zubizarreta, 2009, p. 26).

Reflection, ePortfolios, and our Research Focus

Many authors and practitioners confirm the close relationship between reflection and ePortfolios, leaving open the question of how instructors can most effectively foster student reflection. Given greater acceptance over the past few decades of the constructivist learning model for which ePortfolio is so well-suited, the role of instructor is pivotal (Chism, 2002). Students exhibit varied dispositions toward reflection, and the literature indicates that their readiness is highly important (Rogers, 2001); therefore, instructors must be prepared to offer them flexible guidance. Numerous strategies are available to nurture reflection. On the other hand, as Rogers (2001) pointed out, many instructors have neither “been socialized by their own educational processes” nor “received any formal training” (p. 53) that might give them the confidence to select among strategies for their students.

With so many different terms, definitions, and processes used for reflection, how do faculty and students develop the ability to make reflection a habit of mind? Is it the practices and pedagogies of ePortfolio that facilitate meaningful reflection, the practices of reflection that enable effective ePortfolio development, or a shifting interplay between the two? This inquiry has sought to illuminate these complex relationships.

The Case Study Context

This intrinsic case study is bounded by the campus of IUPUI, an urban research and academic health sciences university in the Midwest enrolling

approximately 30,500 students in 250 undergraduate and graduate certificate and degree programs.

IUPUI launched an ePortfolio initiative in 2000, with the initial purpose of assessing the Principles of Undergraduate Learning (PULs), our general education outcomes. We conducted our first pilots in fall of 2004. As we gained experience working with faculty, staff, and advisors, ePortfolio leaders came to place less emphasis on PUL assessment and institutional goals and more emphasis on the goals and benefits important to potential adopters themselves. Most early projects focused on discipline-specific assessment of student learning outcomes for improvement and/or accreditation.

In 2010, improvements in our software platform opened the door to using ePortfolios for learning and showcase purposes. Adoption accelerated, and pilot-testing of an electronic Personal Development Plan (ePDP), a developmental ePortfolio that would be started in the first-year seminar and used throughout the undergraduate experience, further boosted faculty interest and creativity. The importance of reflection in the ePDP led to increased attention to reflection across the spectrum of IUPUI ePortfolio projects. By the time this research project began in 2011, approximately 30 projects in schools, departments, and centers at all levels from first-year through doctoral study were in various stages of development.

Research Purpose, Inquiry Strategy, and Question

According to Chen and Penny Light (2010), “the value of e-portfolios lies not in the specific tool itself, but in the processes and in the ways in which the concept and the related activities and practices are introduced to students” (p. 27). The purpose of this qualitative case study is to examine the role of reflection in electronic portfolio processes and outcomes at IUPUI. The significance of the study derives from the multiplicity of ePortfolio projects established at IUPUI since 2005, with their varied “issues, contexts, and interpretations” (Stake, 2005, p. 450). The research team identified an opportunity to contribute to ePortfolio scholarship through local “insight, discovery, and interpretation” (Merriam, 2009, p. 42). The research question that guided the study is: Why, how, and with what success is reflection, as a teaching/learning process, employed among ePortfolio projects at IUPUI?

Methodology

A nine-member multi-disciplinary IUPUI advisory group met during the first year-and-a-half of I/NCEPR Cohort VI to define a research purpose and question for IUPUI. The group adopted a constructivist-interpretive

paradigm as appropriate for the qualitative research inquiry strategy pursued by this exploratory study. Given the diversity of ePortfolio projects represented on the IUPUI campus, the constructivist paradigm's assumptions of a "relativist ontology (there are multiple realities), a subjectivist epistemology (knower and respondent co-create understandings), and a naturalistic (in the natural world) set of methodological procedures" (Denzin & Lincoln, 2005, p. 24) suited the qualitative purpose of understanding and describing this diversity.

Once the advisory group identified a purpose and question, a team of four staff members pursued the research activities, periodically touching base with the larger group. All four were deeply involved with IUPUI's ePortfolio initiative and served on the project advisory group. One researcher was Director of the IUPUI ePortfolio Initiative, has been part of the ePortfolio initiative since its early days, and participated as an interviewee on use of ePortfolio in a senior capstone. Another researcher has been ePortfolio Coordinator since 2009. A third team member was an Instructional Development Specialist with the Center for Teaching and Learning. Each knew many of the research participants through professional development sessions, individual or group consulting, and other campus activities. The fourth member of the core research team was a graduate assistant and higher education doctoral candidate with a research interest in ePortfolios. The observational and reflective practice required for qualitative casework (Stake, 2005) was of interest to each of these researchers and prompted them to remain aware reflexively of their own potential biases.

Procedures and Methods

Data Collection Procedures

ePortfolio projects at IUPUI were the unit of analysis, with reflection as the topic of investigation, whether the projects were in degree programs, centers coordinating high-impact practices, or single courses. The research team used two forms of data collection appropriate for case studies: interviews and collection of supporting artifacts.

To gain insight from the broadest possible range of ePortfolio practices, the research team identified 66 faculty and academic staff members associated with all known IUPUI ePortfolio projects through two-level non-probability sampling. The ePortfolio Director sent letters to each individual via campus mail inviting their participation in a personal interview. After e-mail and telephone follow-up a total of 32 faculty and academic staff, representing 14 distinct ePortfolio projects in two centers and 10 of IUPUI's 19 schools, agreed to

participate. Further information about participating ePortfolio projects and interview participants representing these projects is provided in Table 1.

The primary form of data collection was face-to-face interview. Two members of the core research team conducted each semi-structured hour-long interview (see Appendix for the interview protocol and questions). The graduate assistant led all but one interview to maintain consistency in the interview protocol and offer a less familiar face to participants. The second interviewer, rotating among the remaining team members, assured completion of the target questions, helped probe answers with follow-up questions, and requested artifacts. Twenty-four of the interviews were individual; three of the projects requested a small-group interview. Interviewers digitally recorded each session, with permission, and took supplemental written notes.

Thirteen of the 27 interview groups provided artifacts for supporting documentation. Course syllabi constituted the largest group of artifacts, followed by instructions for reflective essays and other ePortfolio assignments, rubrics for assessing reflection and/or ePortfolio effectiveness, and online student work. All artifacts were sent to the research team electronically and catalogued.

Data Analysis Procedures

Each interview was professionally transcribed, checked for accuracy by two members of the core research team, and uploaded into computer-aided qualitative data analysis software ATLAS.ti for coding. The team deductively established a small initial code framework, which grew and changed inductively during analysis (Friese, 2011). "If we typify qualitative casework, we see data sometimes precoded but continuously interpreted, on first encounter and again and again" (Stake, 2005, p. 450).

After coding was cross-checked, two team members conducted multiple conceptual-level analyses, including cross-tabulations for groundedness and relevance, then ran deeper follow-up queries. Members reflected independently on meanings suggested by each query, then discussed their understandings to reach consensus. The graduate assistant also uploaded the artifacts into ATLAS.ti, reviewed each for related content, and highlighted relevant passages. These artifacts, while not a primary contributor to this analysis, served as a reference to clarify practices described by interview participants.

Reliability, Trustworthiness, and Transferability

To assure that the research design enables our readers to make comparisons with their own context,

Table 1
Participating in ePortfolio Projects and Interviewees Representing Them

Department, Program, or Center	ePortfolio Project Primary Purpose	Implementation Level; Scope	Representing Interview Participants	
			Sex (no.)	Role
American Studies	Course Organization	300; Courses	M	S/I
Art History	Capstone Integration	400; Course	M	F/I
Center for Research and Learning	Mentored Research Process Structure	Undergraduate	M	A
Center for Service and Learning	Civic Learning Assessment	Undergraduate	F (2)	S/I
English	Capstone Integration	400; Course	F	F/I
			F	A/I
Museum Studies	Professional Showcase	MA Program	F	F/I
Music Technology	Assessment and Accreditation	BS Program	M	F/I
			F	F/I
Nursing	Assessment and Accreditation	Doctor of Nursing Practice Program	F (2)	F/I
			F (2)	S/I
Pediatric Dentistry	Integrative Learning and Self-Assessment	Graduate/Professional Program	F (2)	F/I
Psychology	Career Preparation Course-Level Integration	300; Course 100; Course	F	S/I
			F	S/I
Social Work	Assessment and Accreditation	BSW Program	F	A/I
Spanish	Capstone Integration	400; Course	F	F/I
			M	F/I
Student African American Sisterhood	Development, co- curricular	Undergraduate	F	S/I
University College in cooperation with:	ePDP, Development	100; Courses	F	F/I
			F (5)	S/I
			F (2)	A/I
			M	F/I
			M	S/I
			M	S/I
Total				32

Note. All interviews were conducted individually except: Nursing, Pediatric Dentistry, and Spanish. Participant roles represent IUPUI campus practice of engaging qualified academic staff and administrators in student learning. M = Male; F = Female; F/I = Faculty/Instructor; S/I = Staff/Instructor; A/I = Administrator/Instructor; A = Administrator; F (no.) indicates specific number of interview participants > 1 in a particular role.

we enacted the following measures for reliability and trustworthiness.

To support reliability, two core research team members checked the transcripts for accuracy (Creswell, 2009). The two members also met semi-regularly to check the codes against the data, in order to avoid code drift. One team member conducted all data coding, while a second crosschecked the coded transcripts against the code list periodically and shared observations to support iterative adjustments throughout the process (Creswell, 2009). Once coding was completed, data analysis was systematic and iterative; the two team members reflected independently on the queries, then conferred to translate meaning from the data into findings.

The trustworthiness of these findings rests primarily upon triangulation of the variety and extent of diverse perspectives that research participants offered (Creswell, 2009; Merriam, 2009). We have also provided rich, thick description in reporting on the study to contribute to trustworthiness so that readers can draw informed conclusions about applicability in their contexts (Creswell, 2009; Merriam, 2009; Stake, 2005).

Findings

Each finding below describes understandings reached through recursive data analysis. The flow of each interview was conversational, and we have illustrated each finding with selected direct quotations from the interview transcripts. Just as we did not impose a single definition of *reflection* in our interviews, we accepted participants' use of other terms such as *metacognition*, *integrative learning*, or *assessment*. In nearly every case, participants used terms in their common English meanings without reference to particular theories. We note in the discussion of Finding 4 and under the general Discussion heading the comparatively few instances where participants' understandings appeared to influence emerging patterns in the data.

One of the most noteworthy results of this study was that it illuminated the commonality of experience and practice with reflection in ePortfolio projects across disciplines and levels of study. Mindful of our qualitative approach and small sample, we have chosen not to quantify our data as we illustrated our findings. Use of quotations "shows" data where we can; in other cases, we have used general description to indicate depth or frequency of themes we discerned.

Finding 1: Few of Those Adopting ePortfolios Began With Reflection as a Primary Goal.

Respondents usually described their primary motivations as some combination of interests: to enhance student learning, assess student learning, foster

student development, facilitate particular pedagogies, prepare for program accreditation, enhance searches for internships, employment, and/or graduate school, undergird advisement, and assess course or program curricula.

On the other hand, some did identify reflection as a secondary goal. For example, one instructor recalled that "someone had heard about ePortfolio and said 'This would be a useful . . . reflection tool for the capstone writers to reflect on their career as art history students.'" Another faculty member reported that

we are very interested in training self-reflective practitioners and saw this as a tool to help them both synthesize the sort of disparate learning experiences they'd had across their graduate program, also to kind of put themselves into that equation.

A staff member of a major center said, "it was through . . . thinking about reflection, talking about ePortfolio as a mode for reflection, not just a receptacle where reflection can occur, that kind of sparked my interest."

These differences of approach mirrored the diffuse understandings of the term reflection that respondents brought to their work. When asked for their own definition of reflection, only three cited theory. Several provided contextual definitions (e.g., service learning, first-year experience, doctoral degree program) or shared an illustrative story. A few observed that their understandings continued to develop. All respondents did see reflection as a process, generally a metacognitive process, though the shorthand reference to "a reflection" as the product of reflective thinking (typically an essay) also appeared regularly. Phrases commonly put forward to describe reflection included:

- Deep thinking or critical analysis;
- Stepping back, or pausing to consider your learning experiences to date in order to determine how to move forward;
- Making connections;
- Integrating learning;
- Realistic self-assessment, examining assumptions.

One advisor provided a vivid illustration:

The sankofa bird [from African mythology] . . . faces backward, but it flies forward. . . . Reflection, for me, is a constant movement forward while continually evaluating things that have happened in your life, be it significant or insignificant things, and how they still continue to try to propel you to move forward. When I think of reflection, I think of the sankofa bird.

Finding 2: Whether or Not Adopters Initially Understood the Importance of Reflection in ePortfolios, Most Recognized and Prized That Role Within the First Term of ePortfolio Use.

This recognition of the value of reflection extended across the commonly recognized types of ePortfolios (assessment or accreditation, teaching and learning, developmental, showcase) as well as across levels of study (first year through doctoral) and learning contexts (curricular, co-curricular, extra-curricular). Purposes most commonly articulated for reflection included:

- To cultivate habits of mind;
- To deepen learning through iterative consideration, questioning assumptions;
- To connect different aspects of educational experience;
- To take responsibility for one's own learning;
- To develop identity as a learner and/or as an emerging professional.

In addition, faculty often articulated benefits for their teaching as they recognized that reflection extended their understanding of student learning, engagement, and/or development. One professor explained:

I think that when you write, and particularly when you write reflectively, it's an embodiment of your thought processes. It's really in the writing that the thinking is clarified, that one is able to draw connections that ordinarily we're not able to draw because our working memories are limited. . . . I've come to think that this is not only an incredibly impactful form of assignment for students to do, but it's also a way that instructors can be assured that the way that they've designed their class, the way that they've been trying to help students learn, is working or not working. I think it is the place where learning is captured.

Finding 3: Instructors Expressed Surprise at Students' Limited Ability to Reflect, and They Subsequently Devoted Considerable Effort to Helping Students Learn How to Think Reflectively.

This concern recurred among graduate and undergraduate faculty alike. Two faculty in a graduate professional program commented, "They're very bright, and they're very convinced that they're bright, so it's difficult to always make them believe that you could look at anything differently." As one instructor of 300-level courses put it, "I'm consistently surprised, and disappointingly so, in how many students, how new an experience or an idea this still seems to some of these

students, to think broadly across a topic. I don't know if it's that they've never been asked or they're afraid of it."

Certainly, instructors of entering students were more likely to anticipate these challenges. Yet even these instructors were sometimes taken aback by the wide variation in student ability to reflect. For example, to help students make connections, the ePDP that IUPUI students begin in their required First-Year Seminars tightly aligns course activities, reflective assignments, and ePDP sections with course objectives and student learning outcomes. Nonetheless, one FYS instructor accustomed to teaching capstones, but using reflection in the ePDP for the first time, observed, "I went from hoping that students would draw these deep connections to hoping that they would just simply answer all parts of the question." Most faculty at all levels reported having to lower their expectations, at least initially.

Though the need to teach reflection took faculty by surprise, their willingness to create that time and space testifies to the benefits they perceived. In many cases, the pedagogical improvements instructors reported making as they gained experience with ePortfolios focused more on fostering reflection than on enhancing course content. The new FYS instructor again:

I was very underwhelmed at my own ability to be impactful as a teacher. I didn't have a great semester. I'm actually really looking forward to this fall as a do-over. We've taken a lot of that stuff out [activities that interfered with time for reflection].

Finding 4: The Purposes of Reflection Related to Wide-Ranging Course or Programmatic Objectives, but May be Summarized in Two Primary Categories: to Help Students Make Connections and to Build Self-Understanding and Metacognition.

The connections sought were diverse:

- between units within a course, out-of-class experiences and in-class curriculum, and/or lived experience and formal learning;
- across groups of courses, whole degree programs, and/or distinct high-impact practices (e.g., undergraduate research, study abroad);
- among interests, aptitudes, possible careers, and related majors; and
- between professional standards and work completed in field experiences.

One course instructor described his purposes for student reflection this way:

If they're showing me evidence of being able to pull in different kinds of interests, different kinds of references, text material, class discussions, conversations they've had with friends, if they're showing evidence of being able to pull all those things together and relate them to whatever particular area they're investigating, that's what I was really after.

As we listened to respondents, we identified distinctions between making connections and integrative learning. Though all respondents used the phrase "making connections," those who spoke more explicitly about integrative learning were largely those engaged with upper-division undergraduate and graduate students. A similar distinction emerged between self-examination and metacognition, though respondents introduced the latter term less frequently.

One advisor in a co-curricular setting vividly described challenges in encouraging student self-understanding and its importance:

I have students who say "I left there, and I'll never go back there. . . . I'm not going to talk about it, period." But I try to show them how acknowledging and opening that door helps them to be able to propel forward. Because you have to know that. I look at it from that holistic standpoint, so that they can make sense out of who they are going to be as a learner and fully engage in their learning process and their experience.

Finding 5. Instructors Reported Using a Range of Approaches to Elicit Reflection Appropriate to the Context.

Once again, methods recurred across levels of study; for instance, instructors in 100-, 300-, and 400-level courses named modeling as one of their approaches to help students understand and adopt habits of reflection. For example, First-Year Seminars employ peer mentors who help with technology and advocate for the ePDP, while a master's degree program relies on previous student cohorts to model reflective showcase ePortfolio preparation. We identified five clusters of approaches commonly used:

- Explanation and advocacy
- Demonstration and practice
- Assignments
- Social pedagogies
- Formative (feedback) and summative assessment

Table 2 provides detailed examples of these practices.

For beginning students, making connections between visits to work environments and skill sets identified through standardized tests provided a course-relevant assignment for reflection. Tightly focused questions (expected to be answered directly, with points deducted for omitting a question) helped these students learn to craft personal essays. Students in a senior capstone course, though often still needing support, generally required less prescriptive guidance. In fact, one capstone professor noted,

I found that if you give enough direction to allow a weaker student to complete the assignment with reasonable success, that is way too much for a better student. What the better students in some cases really directly articulated was their sense that maybe they were being told what we wanted them to say. That was because they already could think these questions through.

Finding 6. Assessment Practices Vary Widely According to Both Students' Abilities and Instructors' Understandings of Reflection.

Instructors who understood reflection as primarily affective were uncomfortable assessing reflective essays. As one first-year advisor put it, "How can you grade reflection? . . . It's like grading somebody on their opinion of something." Some simply felt that completing the exercise was sufficient: *what* students thought mattered less than *that* they thought about the target of reflection; students received credit for completing the assignment, but no grade. Some "split the difference" by providing detailed feedback on drafts, but not grades on a final product. Others, especially those in disciplines accustomed to distinguishing content from expression or assessing on the basis of sufficiency of evidence, usually did conduct both formative and summative assessment of reflective assignments.

Several faculty distinguished between kinds of reflection assignments in determining whether and how to assess them. Assessment decisions sometimes varied by level of study. One first-year faculty member explained that since "About Me" reflection is intended to help students think honestly about their interests and strengths, grading should be more developmentally encouraging than in capstones, where disciplinary approaches to addressing complex problems are established and therefore demand more rigorous assessment.

While somewhat intrigued with multi-modal presentation, several faculty questioned their ability to assess reflection expressed in modes other than written text. Nearly all described their reflection assignments as written essays, with occasional references to oral

Table 2
Practices Commonly Adopted to Foster Reflection in ePortfolios

Practices	Activity Examples
Explanation and Advocacy	Instructor explanation, description, expectations, and suggestions (in class and in syllabus), beginning the first day and aligned with learning outcomes Building student investment in personal benefit of reflection Assigned reading about reflection, often with subsequent class discussion
Demonstration and Practice	Showing (and discussing) reflective essay examples Instructor modeling of reflective practice (pausing in class to call attention to his or her own reflective process or to describe personal experience with peer feedback) Collaborative instructor highlighting of connections between linked courses Low-stakes practice exercises, with or without the opportunity for revision, including stepped preparatory assignments Assignment of journaling (or lab notebooks) as precursor to formal reflective essays
Assignments	Using clear, common structures for assignments across course or program Layering assignments to complete a project in stages Clustering assignments to clarify their connections Posing leading questions or prompts Allowing pauses for ideas to percolate, lessons to be absorbed Pulling in alternate modes to reinforce or duplicate reflection (e.g., visuals, engaged practices, shifting format from matrix or outline folio to presentation portfolio)
Social Pedagogies	Peer modeling by course mentors or by students in advanced cohorts Beginning with group discussion (oral practice), then shifting to individual written practice and vice versa Peer feedback in ad hoc or extended groupings (or occasionally a considered decision not to use peer feedback)
Formative Assessment	Informal instructor feedback (on drafts and/or on graded assignments), summative often extended and conversational, sometimes in person Customized approaches to summative assessment, including small groups of faculty (with or without subsequent evaluative comments to students), faculty and field supervisor consultation, as well as oral presentations to peers and/or external guests

presentations of ePortfolios. Beyond these familiar academic modalities, they were uncomfortable. For example, “One student asked if they could write a song or a series of songs to represent their experiences. Fabulous idea, great idea, but how do I assess that? . . . I’m not trained in song structure or anything like that.”

More often, interviewees articulated challenges with respect to writing: in particular, a close relationship between writing ability and reflecting ability. Expressing the perception that lack of

writing skills limited effectiveness of a reflective essay, one instructor commented:

They were mentioning material that we’d read in class, and they were active in class discussions, so clearly they were engaged, but they just weren’t very good writers. . . . The ideas were there, but they were unstructured. Because they were unstructured, they lacked in places maybe some supporting detail that students who were better

writers just naturally incorporated. It was difficult at times to fairly assess them.

To offset that difficulty, another instructor described spending class time on oral reflection as a means of helping students “practice reflection in a way that they’re more comfortable.”

Sensitivity to the needs and abilities of their students was a hallmark of most of our respondents. One instructor who teaches a First-Year Seminar for students who have not yet declared a major explained why she flatly refuses to use peer feedback: “That’s just not valuable time, for them to be critiquing each other in this. Plus, they’re pretty sensitive right about now and they’re talking about stuff that’s pretty personal. I’m just not opening that can of worms.” As a capstone instructor explained,

You’re bringing in your recognition that you’ve got somebody who’s maybe been pretty slick all his life and is a good thinker, is basically a good person, but he’s been coasting on charm a lot of the time. Because this is a good person and not a con artist, you can then sort of work with “okay, you know, this is really nicely written . . . but there’s not maybe as much substance as there might be.”

Finding 7. Many Respondents Perceived Students as Achieving More Successful Reflection With Self-Evaluation Than With Integrative Learning.

Beginning to build self-knowledge is an important developmental criterion for the first-year ePDP, and these instructors valued the way reflective essays could demonstrate learners’ growing awareness of individual academic identity as well as acceptance of responsibility for their own learning decisions. Even within a single course, one noted: “I’m not sure how you articulate that, but you can see a difference from their About Me to what they wrote in their Career Goals. There’s a different level of maturity, almost.”

Capstone and graduate faculty, however, also remarked on ways that well-prepared reflective essays include self-evaluation—here sometimes using terminology of metacognition. One respondent explained: “The good reflective essays are the ones that do link their work because there is also some self-evaluation in the interface.” Even at the graduate level, “For usually a few students each year, it’s that light bulb kind of moment. ‘Oh, that’s why I’m drawn to this kind of work!’” Nonetheless, instructors struggled to help students achieve depth in integrative reflection, generally with uneven results:

We hoped that the experience of putting together some artifacts and looking back at their work from

early on and comparing—one of the reflection questions is “Does your work demonstrate a trajectory of development?” We try to guide them in that direction; we try to prompt them. We certainly saw that in some students and not in others.

Finding 8. Respondents Often Described Success in Terms of Seeing Evidence That Students Had Learned and That the Program or Course Had Value for Their Students.

The word *transformative* seems appropriate for the levels of success some reported. For example:

To see where they were two and a half years ago, and then to read from their own voice, in their own voice, how transformative the program had been for them, how it broadened their view and opened their eyes and made them a different practitioner and different leader—really, really gratifying . . . The students seemed to use their individual ePortfolios as a transformative, reflective learning experience.

From another: “You feel that the experience of putting the portfolio together and writing reflections has really been successful and has made an impact.” And “There’s reflection there, but it’s personal reflection, it’s not—honest—from us, it’s coming from them, which to me means they’re actually learning.” One instructor said, “it really gave [the students] a sense of their competency and increased their confidence in what they were doing. I think when it works, it works great.” Or another, speaking of first-year students: “I love watching them start to think and see these light bulbs come on.”

Some faculty, of course, defined success with reflection in terms of accomplishing course or program learning outcomes. For example, a team from a senior capstone noted, “They actually do a pretty good job about saying, ‘Well, when I learned about these dialects in linguistics, then I could see it when I read this piece from this particular country.’ It’s very revealing for us.” In a 300-level course,

The level of writing I got out of those students as the semester went on was incredible. I mean it bordered on just eloquent, some of the observations that they would make . . . I’m positive I wouldn’t have gotten that level of writing out of them, that quality of writing, if it had been in a more traditional format.

Or “If they show that evidence of being able to think more broadly, holistically across the topic, and beyond the topic, that’s a success.”

Finding 9. Respondents Also Noted Direct Benefits for Themselves and Their Projects From Improved Understanding of Their Own Curricula as They “Closed the Loop” on Their Assessment and Reflected Ever More Deeply on Their Own Teaching Practice.

For some projects, especially those identified as assessment-focused, curricular improvement is an important desired outcome, and the reflective ePortfolios typically met such goals. One program director noted, “We made a change, a major curricular change in 2009, and a lot of that was due to the way we’re doing the capstone portfolios.” Another group reported on the benefits for faculty in thinking holistically about courses in their program:

I really think it made for a much higher quality of course development . . . It not only made it more clear how their own course material related, but it made [faculty] much more knowledgeable about what was being taught in other courses, how all of it fit together to achieve the program outcomes and standards.

Plans to expand ePortfolio adoption provide another indicator of success. In some cases, experiments with reflective ePortfolios in a capstone spurred interest in introducing ePortfolios earlier in a program: “We decided that the ePortfolio would be much more useful if they’d had it for four years rather than one semester at the very, very end.” In another case, experience in a First-Year Seminar is leading to expansion into subsequent courses: “It was because of my experience in that FYS that now . . . we’re going to drive it into the program.”

Discussion

The use of reflection as a teaching and learning practice is certainly not unique to ePortfolio adopters but, as the preceding literature review observes, ePortfolios and reflection are allied practices. Nonetheless, educators who adopt ePortfolios invariably seem surprised by the importance of reflection. Our own findings indicate that this realization is largely welcome and that reflection subsequently becomes a focus of teaching and learning that brings numerous benefits. As we noted, the challenge arises from the extensive support many students need in order to learn to reflect. Several instructors did explain that, with experience, they tried

to integrate the reflection and/or ePortfolio work more fully into the whole of the course or program rather than, as they may have done initially, simply adding ePortfolios as a new component.

Choices of instructional strategies varied according to the kind and level of reflection desired (e.g., affective, integrative, metacognitive). Some adjustments of approach, on the other hand, were grounded in instructors’ understanding of their students’ maturity as learners, with prescriptive assignments and clear rubrics often preferred for entry-level students and suggested ideas and topics for more advanced students. Those adjustments depended primarily on the experience of the instructors, but were also indirectly influenced by their concepts of reflection.

We observed that instructors’ varied understandings of reflection also influenced their decisions about how to use and whether or how to assess reflection. The differences among major theories found in the literature on reflection were evident among those we interviewed as well. Our interviews revealed connections between decisions about whether and how to assess a reflective essay and understandings of the nature of reflection as personal/affective or academic/cognitive.

In addition, our findings highlight the tension between common faculty (mis)perceptions of assessment and their understandings of reflection. The more dubious the interviewees about assessment as they understood the term, the less likely they were to believe that reflection could or should be assessed. Some members of this group of interviewees voiced assumptions that assessment required elaborate rubrics with numerical scores, multiple-choice tests, or multiple external reviewers. The more the interviewees believed reflection to be a matter of personal expression, the less likely they were to grade such an assignment (though they might well provide substantial feedback, not recognizing that as formative assessment).

Several of our findings have implications for enhancing professional development for faculty, advisors, and others who work with ePortfolios. Preparing instructors to recognize the importance of reflection—and the likelihood of student difficulty in reflecting—can help forestall some of the dismay, regret, and/or mid-semester reinvention we heard about during the interviews. Identifying the ways in which one’s understanding of reflection might influence instructional decisions can help assure that choices are based on intended learning outcomes rather than on unrecognized assumptions. Moreover, though we do not advocate forcing everyone to adopt a single “right” definition of reflection, both faculty and students can benefit from awareness of the multiplicity of understandings, so that, for example, students can avoid

responding to one instructor's reflection assignments based on another's explanations of reflection the previous semester.

We noticed several other topics that appear ripe for focused professional development and also future research. As noted, written text is by far the most pervasive form of reflective expression assigned, despite the potential benefits for students of the multimodal forms of expression ePortfolios make possible. Seminars and communities of practice might foster familiarity with alternatives like photographic essays, digital storytelling, and songwriting while developing strategies for assessing reflection presented via alternate modes. Colleagues from rhetoric and composition as well as art, music, and visual communication can help advance our collective practice. In addition, we see opportunities to improve understanding of why and how to assess reflection in ePortfolios, and of the benefits of reflection for assessment ePortfolios.

In informational workshops and conference presentations, we have often heard faculty express concern about adopting ePortfolios because they will require significant additional work. In our interviews, we observed that some instructors felt obliged to provide extensive written (and sometimes oral) feedback to students, especially on more personal reflective essays. We posit that these circumstances may help explain the "extra work" reputation; if so, then scaffolding of reflection assignments and options for use of peer or external feedback may be other subjects for attention in professional development. Further research on the accuracy and source of the extra work perception appears warranted.

Finally, because so many interviewees remarked on their greater success with more elementary levels of reflection (making connections and self-awareness), professional development might focus on effective ways to elicit more advanced forms and greater depth of reflection (integration and metacognition). In this area of development, approaches might include extended seminars, communities of practice, or mentoring.

Limitations

The project team maintained awareness of potential limitations, and our design attempted to minimize the potential impact of the three we considered most relevant in our research context, as described below.

Backyard Research

Familiarity can be a challenge for researchers conducting case research in their own backyards. According to Creswell (2009), familiarity "often leads

to compromises in the researcher's ability to disclose information and raises difficult power issues" (p. 177). To address research trustworthiness, we employed two strategies in addition to having the graduate assistant act as lead during interviews. First, we minimized the role of the team leader in analysis, since she was also an interview participant. Second, we took measures (mainly through informal discussion and notes generated during analysis) to maintain awareness of researcher reflexivity and the ways in which it might influence thinking.

Sample

As noted in the Methodology section, we invited all known IUPUI ePortfolio projects to participate in this study, hoping that multiple participants from the larger projects would offer different perspectives on our research question. Some projects were represented by a single interview with one person; three involved single interviews with two to four representatives; two projects were each represented by two separate interviews with individual faculty; one large project was represented by 12 individual interviews. We offset the potential imbalance among smaller and larger projects by focusing analysis on ePortfolio project purposes (i.e., assessment, learning, development, and so on) and on levels of study (i.e., first year, senior capstone, graduate program, and so on) rather than overall proportion of different responses. At the same time, we acknowledge the possibility of socially constructed influence on responses during the three group interviews.

Boundaries of Time

Interviewees had varied amounts of experience; several were only in their second semester of using ePortfolio, while others had several years of experience. In itself, this enriched rather than limited the information gathered through interviews. On the other hand, the IRB restricted gathering of supporting data (in the form of course syllabi, assignments, sample reflective essays, and sample student ePortfolios) to a single academic year. Since it proved impossible to limit the content of interviews to only an equivalent time period, the artifacts we collected proved less useful than anticipated.

Conclusion

Reflection in ePortfolio projects can foster many forms of student success, as our interviewees repeatedly explained. Those new to ePortfolios, even those with interest in reflection at the outset, seldom anticipated the range of learning opportunities reflection offered,

much less the number of challenges they faced. Despite stereotypes about types of ePortfolios or capabilities of students at different levels, ePortfolio practitioners appeared to share purposes and practices, frustrations and successes, professional growth and rewards. Our findings suggested numerous opportunities for expansion of faculty development and sharing of research across disciplines that, given reflection's central importance in ePortfolio practice, should benefit the growing field.

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Appendix

The Role of Reflection in Electronic Portfolio (ePortfolio) Processes and Outcomes at IUPUI

Faculty and Staff Individual Interview

Construct Date: January 30, 2012

Interview Specifications:

- Date: _____
- Time: began at _____ (a.m./p.m.), and ended at _____ (a.m./p.m.)
- Number of invited participants: _____
- Number of actual participants: _____
- Room Setting: _____ Private _____ Semi-Private _____ Public
- Room Location: _____ (building) and _____ (room name/no.)
- Format: interview questions tailored to individual
- Recorded: _____ Yes _____ No
- If Yes to above, were appropriate permissions secured?: _____ Yes _____ No
- Interviewer(s) (please print): _____
- Participants (please print): _____
- Rich description: _____

Pre-Discussion Statement:

Researcher(s) reads following statement to discussion participants after they have agreed to participate in the discussion group interview:

As the leader of an ePortfolio project, thank you for being willing to participate in this individual interview focused deeply on your perceptions about the role of reflection in your ePortfolio projects. There are no foreseen risks associated with participation in this conversation. You can opt out at any time. All answers will be confidential, and our discussion should take no more than 1.0 hour. We would like to ask your permission to digitally record this interview? Do you have any questions before we get started? I will give you my business card and you are welcome to use it to contact me if at any time you have questions after this interview concludes.

General Introductory Questions: General Introduction

- What prompted your initial interest in having your students use/develop ePortfolio?
- Tell me about your experience of preparing to teach the ePortfolio component in your curriculum.
- How did your students respond initially to the overall concept of the ePortfolio?
 - How did these initial responses change over the course of developing their ePortfolio?
- How do you feel about the role of reflection in the ePortfolio process?
 - How would you define “reflection”?
 - Tell me about how your students were able to use reflection in building their ePortfolio.
- What kinds of relationships among artifacts did students identify?
 - What evidence do you have of how students perceive such relationships?
- Do students assess their work differently when they see multiple artifacts together?
- What role does reflection play in students’ understanding and integration of the artifacts?
 - What does all of this mean for ePortfolio practice and authentic assessment?

Thematic Questions

Re. Purpose:

- What was the purpose of reflection in your particular context?
- How was reflection expected to support and/or demonstrate student learning in that context?

Re. Learning Context:

- How do you define reflection in the context of your discipline or course?
- What is/was the framework for reflection?
 - Single course?
 - Program?
 - Engaged practice such as research or service?
 - In what field and at what level of study?

Re. Basis:

- What is/was the basis for student reflection?
 - One or more experiences?
 - Single piece of work?
 - Cumulative body of work?
 - Other?

Re. Process:

- How is/was reflection fostered?
- What questions or directions are provided?
- What genres are encouraged or permitted?

Re. Assessment:

- How was reflection assessed?
- By whom and according to what criteria?
- Are some kinds of assessment more appropriate for different types of reflection?

Re. Environment:

- How does the ePortfolio environment contribute to successful or effective use of reflection?

Re. Evaluation:

- By what standards was a use of reflection judged successful?