

The Role of Reflection in ePortfolios at IUPUI I/NCEPR Cohort VI Final Report

At Indiana University-Purdue University Indianapolis (IUPUI), departments, courses, and centers for coordinating high-impact practices have undertaken numerous and varied ePortfolio projects for a range of purposes. Preparing for the next stages of our ePortfolio Initiative, campus leaders entered Cohort VI of the Inter/National Coalition for Electronic Portfolio Research (I/NCEPR) expecting to focus on 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. We therefore reframed our research to help us identify more specifically the ways in which reflection contributes to perceived success (as formulated by the department or instructor). We continued to believe that because IUPUI has so many different kinds of ePortfolio projects, our microcosm could usefully produce information that could assist others at IUPUI and throughout higher education in identifying helpful strategies and avoiding possible stumbling blocks.

Research Question

The purpose of this qualitative case study was 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. 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?*

Related Literature

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 universal 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 scholars: Boud, Keough and Walker; Dewey; Langer; Loughran; Mezirow; Schön; and Seibert and Daudelin. His analysis informed our study, since it offered a broad view of "commonalities in terminology, definitions, antecedents, context, processes, outcomes, and techniques to foster reflection" (p. 37). Among the seven theoretical approaches, Rogers (2001) identified fifteen different terms to describe reflection. He added 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. 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).

As with reflection, definitions of ePortfolios vary widely (Pitts & Ruggirello, 2012), and current ePortfolio practices are similarly varied, usually involving “instruction, assessment, and professional development” (Watson, 2012, p. 3969), singly or in some combination. Despite this variability, however, Brown et al. (2012) confirmed in an analysis of the *2012 AAEEBL Survey* an emerging agreement that ePortfolios change the way instructors think about teaching and learning as they observe how “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). Building on work by Peter Ewell on indicators of curricular quality (1997), Yancey (2004) described how ePortfolios provide a structured framework for learners to voice and understand their own experiences as an educational journey across the *delivered* curriculum of the classroom, the *experienced* curriculum as students receive and practice the delivered curriculum, and the *lived* curriculum of learning from all sources in and beyond the classroom.

Banta (2003) observed that “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. Walvoord (2010) highlighted the importance of guidance on collecting and reflecting on artifacts, along with feedback and support to help students grasp the value of ePortfolio development.

ePortfolios 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)

Similarly, Moon (2004) argued that reflection is an “essential basis for good quality (meaningful) learning” that in turn “underpins other aspects of employability” (n.p.) 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.

No matter the original purpose for an ePortfolio project, evidence supports the importance of reflection. In addition to supporting the varied purposes noted above, “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 earlier I/NCEPR cohorts’ 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) and 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).

Many authors and practitioners thus confirm the close relationship between reflection and ePortfolios, leaving open the question of how instructors can most effectively foster student reflection. Frequent references to the importance of structured frameworks, however, suggest that the role of instructor or mentor 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) points 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. How then 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 sought to illuminate these complex relationships.

Processes of Inquiry

Methodology

The nine-member IUPUI research team for this study deliberated over the first year-and-a-half of I/NCEPR Cohort VI to articulate a research question responsive to campus needs and interests. Given the diversity of ePortfolio projects represented at IUPUI and team consensus on knowledge as socially constructed, the group chose a qualitative research strategy for this exploratory study to understand and describe that diversity (Denzin & Lincoln, 2005). A sub-set of four members then carried out IRB approvals, data collection, analysis, and reporting. Because all four were deeply involved with IUPUI’s ePortfolio and ePDP initiatives, all researchers kept notes to remain aware reflexively of potential biases.

Procedures and Methods

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. After securing IRB approval of exempt status for the project, the research team used two forms of data collection appropriate for qualitative research and case studies: interviews and collection of supporting artifacts. The ePortfolio Director invited 66 people, representing faculty and academic staff from all known IUPUI ePortfolio projects, to participate in a personal interview. Final participants included 32 faculty and academic staff, representing 14 distinct ePortfolio projects in 2 centers and 10 of IUPUI’s 19 schools. *Appendix A* provides detailed information about study participants and their projects.

Two members of the core team conducted each semi-structured, hour-long, face-to-face interview. One member led all but one interview to maintain consistency in the interview

protocol; the second interviewer rotated among the remaining team members. Twenty-four of the interviews were individual; three of the projects requested a small-group interview. With permission, the interviewers digitally recorded each session and took supplemental written notes. Thirteen of the 27 interview groups followed up to provide supporting documentation, primarily course syllabi but also instructions for reflective essays and other ePortfolio assignments, rubrics for assessing reflection and/or ePortfolio effectiveness, and online student work. The research team received and catalogued all artifacts electronically.

Following professional transcription of each interview, two members of the core team checked all transcripts for accuracy and uploaded them into ATLAS.ti for coding and analysis. The team deductively established a small initial code framework, which grew and changed inductively during analysis. One team member conducted all coding, with periodic cross-checking by a second person and subsequent discussion for adjustments. The two team members conducted multiple conceptual-level analyses, including cross-tabulations for groundedness, and ran follow-up queries. Members reflected independently on meanings suggested by each query, then discussed their understandings to reach consensus. Supporting artifacts were tapped as needed to clarify a participant's practice.

We adopted this methodology in part to support reliability (Creswell, 2009). The trustworthiness of our findings rests foremost on triangulation of the variety and extent of perspectives that research participants offered.

The Case Study Context

This intrinsic case study is limited to the campus of IUPUI, a Midwestern urban research and academic health sciences university 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, ePortfolio leaders gradually placed less emphasis on PUL assessment and institutional goals and more emphasis on goals defined by potential adopters themselves. Most early projects focused on discipline-specific assessment of student learning outcomes. In 2010, expansion of our software platform encouraged more use of ePortfolios for learning and showcase purposes. Adoption accelerated, and pilot-testing of an electronic Personal Development Plan (ePDP), a developmental ePortfolio begun in the First-Year Seminar and used throughout the undergraduate experience, led to increased attention to reflection across the spectrum of IUPUI ePortfolio projects. By the time this research project began in 2011, approximately thirty projects in schools, departments, and centers at all levels from first-year through doctoral study were in various stages of development.

Main Findings

Finding 1: Only a 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, support searches for internships, employment, and/or graduate school, undergird advisement, and assess course or program curricula.

On the other hand, several did begin with reflection as an explicit goal. For example, one 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 co-curricular 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, 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, 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 to consider your experiences to date to determine how to move forward
- Making connections
- Integrating learning
- Realistic self-assessment
- Examining assumptions

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 of 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. . . . 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 almost always 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. 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."

Instructors of entering students were more likely to anticipate these challenges, but even they 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 most faculty by surprise, their willingness to create that time and space underscores the benefits they perceived. In many cases, the pedagogical improvements instructors reported making 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.

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 primarily 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 described challenges in encouraging students to reflect toward self-understanding:

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 example, instructors in 100-, 300-, and 400-level courses named modeling as one of their approaches to help students understand and adopt habits of reflection. First-Year Seminars assign peer mentors to 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

Appendix B provides detailed examples of these practices.

Tightly focused questions (expected to be answered directly, with points deducted for omitting a question) helped entering 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.

Faculty who understood reflection as primarily affective were uncomfortable assessing reflective essays (including but not limited to grading). 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 provided detailed feedback on drafts but not grades on the final product. Others, especially those in disciplines accustomed to distinguishing content from expression or assessing on the basis of sufficiency of evidence, 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 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 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.”

Often interviewees acknowledged the challenge presented by limited writing ability. 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.”

In fact, 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.” 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 particular success with self-evaluation.

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, some instructors struggled to help students achieve the depth they expected from reflection by more advanced students, 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 term “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: “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.”

Some faculty, of course, defined success with reflection in terms of accomplishing specific 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.

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 is certainly not unique to ePortfolio adopters but, as the literature on ePortfolios repeatedly makes clear, ePortfolios are dependent on reflection. Nonetheless, educators who adopt ePortfolio often seem surprised by the importance of reflection. Our own findings indicate that this realization is welcome and that reflection subsequently becomes a focus of instructional and learning activity 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 observe that, with experience, they tried to integrate the reflection and/or ePortfolio work more fully with the whole of the course rather than, as they had done the first time through, simply adding it as a new component.

Choices among 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 a tension between common faculty (mis)perceptions of “assessment” and their understandings of “reflection.” The more dubious the interviewees about “assessment,” 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; most conflated assessment with grading. 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).

Limitations

Familiarity can challenge researchers undertaking 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). The research team minimized

the role of the team leader in analysis, since she was also an interview participant. The team also took measures, through informal discussion and notes generated during analysis and through researcher reflexivity journals, to maintain awareness of potential bias.

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. In three cases, however, participants requested combined interviews for their own schedule convenience. To help offset potential imbalance, we focused our analysis on projects as distinguished by purposes and level of study rather than on the number of individuals interviewed. At the same time, we acknowledge the possibility of socially constructed influence on responses during the group interviews.

Interviewees had varied amounts of experience with ePortfolios, ranging from one to multiple semesters. This enriched rather than limited the information gathered through interviews; however, the IRB restricted supporting data 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.

Value of Research for ePortfolio Practice at IUPUI

Our research findings allow us to identify patterns of use of reflection in ePortfolio practice, including the ways in which reflection contributes to approaches to grading and assessment. We expect to apply this new understanding to strengthen our campus professional development initiatives (both consultation and workshops) related to reflection, ePortfolio pedagogy, and assessment. We also expect that further mining of the interview results will help us articulate clearly the stages through which faculty and students move in broadening and deepening reflection across purposes and levels of study. In turn, this will expand the benefit of our research beyond the realm of ePortfolio use to support the increasing number of disciplines at IUPUI that are adopting reflection to facilitate student learning. IUPUI's new strategic plan places a high priority on student success; we see opportunities for the ePortfolio Initiative to contribute in new ways to that priority.

Value of Participation in the Coalition for Our Research and Practice

Discussions with “critical friends” in Cohort meetings helped us to articulate a research question. The time set aside at those semiannual meetings for institutional work, and the intervening phone conversations with I/NCEPR project leaders, helped us improve our intended methodology and pushed us to establish timetables for our work. We gained valuable understanding of the potential for reflection from hearing about ePortfolio practice at all of the other Cohort members' institutions. Preparing for the semiannual meetings prodded very busy people to convene for discussion, in the course of which we learned more about our campus practices and benefitted from the differing professional experiences of our colleagues. Even before conclusion of the Cohort, the IUPUI research team members drew on Cohort readings and learning gained from Cohort discussions of the four hypotheses—particularly on interaction of pieces of evidence, relationship between evidence and reflection, and ePortfolio composition as reflection—to improve and enrich our consultation and professional development workshops, to contribute to

developing a conceptual model for IUPUI's electronic Personal Development Plan, and to ground other presentations on and off campus.

Plans to Disseminate and Apply Findings

We will share our final report within the IUPUI community, beginning with all those who participated in the study, and post it when complete on the ePortfolio Initiative website. We have already begun to apply insights to our professional practice locally, and we will encourage ePortfolio users and other practitioners of reflective pedagogy to apply our findings to their own work. We have made preliminary presentations based on partial results at the AAEEBL annual conference in July 2014 and the Assessment Institute at IUPUI in October 2014, and we have a more complete presentation accepted for the AAC&U ePortfolio Forum in January 2015. We hope to publish in various professional venues, and have submitted a manuscript to the *International Journal of ePortfolio*. Many of the faculty who participated in the project expressed interest in co-authorship of presentations and/or publications.

Implications and Opportunities Emerging from Our Inquiry

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—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 learning outcomes rather than on unrecognized assumptions.
- 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.
- Many faculty would welcome increased familiarity with alternative forms of reflective expression like photographic essays, digital storytelling, and songwriting along with strategies for assessing reflection presented via alternate modes.
- There appear to be opportunities to improve understanding of why and how to assess reflection in ePortfolios, and of the benefits of reflection for assessment ePortfolios.
- Because so many interviewees remarked on their greater success with more elementary levels of reflection (making connections vs. integration, self-awareness vs. metacognition), professional development might usefully focus on effective ways to elicit more advanced forms and greater depth of reflection.

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Appendix A Participating ePortfolio Projects

Department or Program	Purpose	Level
American Studies	Course organization	300-level courses
Art History	Capstone integration	400-level
Center for Research and Learning	Mentored research process structure	Undergraduate
Center for Service and Learning	Civic learning assessment	Undergraduate
English	Capstone integration	400-level
Museum Studies	Professional showcase	MA program
Music Technology	Program assessment and accreditation	BS program
Nursing	Program assessment and accreditation	Doctor of Nursing Practice program
Pediatric Dentistry	Integrative learning self-assessment	Graduate/professional
Psychology	Career preparation Course-level integration	300-level 100-level
Social Work	Program assessment and accreditation	BSW program
Spanish	Capstone integration	400-level
Student African American Sisterhood	Development, co- curricular	Undergraduate
University College in cooperation with Business, Education, Biology, Psychology, and Organizational Leadership and Supervision	ePDP, Development	100-level

Appendix B

Practices Commonly Adopted to Foster Reflection in ePortfolios

Explanation and advocacy	Demonstration and practice	Assignments	Social pedagogies	Formative and summative assessment
<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • Informal instructor feedback (on drafts and/or on graded assignments), 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