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Promoting Self-regulation and Critical Reflection Through Writing Students' Use of Electronic Portfolio

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The role of reflection in the learning process has taken on new significance in a digital environment. The potential of using innovative teaching methods to prompt first-year writing students to self-regulate learning behaviors and write more critical reflection statements when using electronic portfolios was studied over eight fall semesters. Results showed that using student surveys and focused in-class discussion in conjunction with consistent ePortfolio assignments not only dramatically increased the length of reflection statements written but also the depth of thinking shown in those statements. These results demonstrate the effectiveness of using intentional instructional strategies for helping students develop self-regulation and critical reflection skills.

The notion of reflection and its importance to learning has been recognized and discussed for decades. Kitchenham's (2008) recent article traces the development of Mizerow's transformative learning theory, a key component of which is reflection, beginning in the late 1970s and continuing for more than 35 years. In the early to mid-1980s the discussion evolved through foundational work by Schön (1982) and Kolb (1984). However, this well-established concept took on new importance when technology made it possible for reflection to occur in a digital environment. Irvin's (2004) "Reflection in the Electronic Writing Classroom" states that despite all the attention reflection has received, "little has been written explicitly on the role of reflection in the electronic classroom" (para. 2). Irvin notes that the most complete look at reflection and writing, Yancey's 1998 *Reflection in the Writing Classroom*, ends by posing the then unanswered question of how conducive an electronic environment would be for student reflection and what difference a more public arena would make in fostering such reflection. Since that time, the "electronic environment" has been increasingly dominated by the use of electronic portfolios, and, as Cambridge (2010) notes, "Traditionally reflection has been a key component of portfolios . . . " (p. 25). Despite the attention paid to the importance of reflection to learning, however, little is found on how to elicit excellent reflection from our students. Granted, resources such as Barrett's (2011) well-documented web site provide a wealth of information concerning portfolio use, including a link to a site devoted to reflection. However, examining such resources can still leave us wondering: What do I actually *do* in the classroom to promote critical reflection for learning?

The answer to this question took on particular significance for me in 2001, when we began requiring that all first-year writing students use the university's electronic portfolio system to document their learning. The developers of our portfolio, which originated in 1996, clearly understood the importance of self-reflection because they included text boxes explicitly for that purpose. In fact, the original concept of our electronic portfolio system, known as ePortfolio, was driven by four learner-centered principles conceived by Paul Treuer, the faculty member and visionary behind the tool developed and used at the University of Minnesota Duluth (UMD). These four principles are:

1. Students not only own their portfolios and the information they contain, but also have responsibility for managing that information.
2. Students learn to manage that data responsibly by selecting which singular pieces of information—text files, digital images, videos, or audio—to share with each and every potential viewer of the portfolio. In other words, because the portfolio is not merely a web space or a DVD that displays the same information to all who view it, students must select the items as well as choose the individuals who will see those items in any number of combinations, thereby having the potential to customize the portfolio for each viewer or group of viewers.
3. Students are encouraged to create a lifelong record of their learning through the University granting its graduates lifelong access to their portfolios.
4. Students are urged to consistently reflect on their learning, not only while at the university but beyond.

These four principles represent steep learning goals, particularly for first-year students, but the first and second goals are somewhat more easily attained than the third and fourth. The objectives of taking ownership of the portfolio and using it responsibly begin to be realized by simply using the tool. Unlike similar applications that are more familiar to the

students, such as Facebook, ePortfolio allows no other person access to the digital text and images a student chooses to upload unless the student intentionally and thoughtfully grants that access. Students understand the portfolio is theirs alone and learn to appreciate the importance of being selective, both in terms of what to share and with whom. In contrast, merely requiring use of the tool for one semester does little to achieve the more complex third and fourth goals of fostering lifelong learning and consistent reflection on it. A large part of the difficulty may be that most college students are product—not process—driven. Much research on student motivation (Svinicki, 2004; Lowman, 1990; Milton, Pollio, & Eison, 1986) indicates students are too often motivated by grades or performance rather than learning. Experience working with such students shows us they want to know what is due and when, not dwell on what they did to finish the task or what they actually learned by doing so. As a result, each assigned task in each course can easily become a singular item on the checklist for reaching the ultimate goal—graduation. Learning becomes fragmented and compartmentalized, instead of fluid and ongoing.

The Research Question: Recognizing and Defining the Problem

The evidence that ePortfolio's higher-level learning goals were far from being met in my freshman writing courses was abundant. In reviewing the so-called "reflection" statements my students included in their portfolios over the first four years they used the tool, I found little that could be deemed reflective in nature. For example, in fall semester 2001, the first year of required use, my students' typical reflection statements contained nothing more than the words "paper" or "Final RP [research paper]" in the text box designed for this purpose. Similarly, in fall semester 2002, I found phrases such as "my reserch [sic] paper." After encouraging students to be more complete in their reflection statements, students in the fall terms of 2003 and 2004 began to at least write full sentences; for example, one reflected, "This is the research paper that I worked on all semester piece by piece. It is on organ donation." Alas, this was not even close to the in-depth look at learning I had hoped students would take by using our ePortfolio system.

To be fair, some of the higher-achieving students, apparently noting that the text boxes designated to hold their reflection statements held 250 words, did write more than two-sentence reflection statements. Unfortunately, these statements proved only to be longer, not more reflective:

> This is my final composition research paper…I learned how to write a topic proposal [and] critical analysis along with many other writing styles. I learned how to correctly write thesis statements, unified…paragraphs, and a memo format. Paraphrasing, in-text citations, MLA documentation, and transitions were commonplace and necessary for a quality paper. I learned how to organize materials…[and how to] utilize the library databases.

While this is a fairly good list of what was covered in class, it was only that—a list of what the student had done. Actual reflection on any learning that may have occurred while creating these products or the significance of that learning was still missing.

Realizing the students' reflection statements were lacking but not being able to identify why, I began my own reflecting on what a "good" reflection statement is and how, or whether, I was teaching my students to write one. This led to the discomforting conclusion that far from teaching students how to reflect on their work, I had relied on two unproductive approaches. The first was "reflection on command," an exercise which occurred during our computer lab sessions when students would upload papers into ePortfolio and I would say, "Now write a reflection statement." This approach produced the one- and two-word reflection statements. Seeing this approach fail, I tried the "castor oil," or "do it because it's good for you," argument. The goal was to convince students that "someday" they would be glad they had written about what they learned because it would help them land a job after graduation. To assist them, at the term's end I asked students to name something each had learned in class. Distributing the list to each student before writing their final reflections resulted in the longer, yet still unreflective, descriptive statements of the course content. Inadvertently, I had contributed to their viewing the class as a list of tasks that got them successfully through my course and on to the next. Clearly, it was not my students but my strategies that were failing to produce quality reflection statements.

As this failure on my part became evident, I was invited to participate in an interdisciplinary research project with two faculty members from each of our five collegiate units. We found all ten participants were experiencing similar learning issues with first-year students. In particular, the students seemed largely unaware of the fact that they could exercise a great deal of control over their learning by simply understanding how they best learn and then relying on those strategies to guide them. A funded grant proposal aimed at studying this issue provided the group with research monies for a three-year period.

Since the group had already identified the need for students to understand how they, as individuals, best learn, the first task was to search for ways to help

students accomplish this goal in each faculty member's classroom. My project led me to Wade, Abrami, and Sclater (2005), who say, "Portfolios can provide evidence of student self-regulation. Students may review their own work and then modify their learning goals as a result of such reflection" (para. 18). The question for me was this: How do I get first-year students to do that effectively?

Reading the literature provided useful, albeit incomplete, information on motivating students to share the responsibility for their learning and to enhance it through critical reflection. Svinicki (2004) emphasizes that to motivate students, educators must help them recognize strategies for learning, which involves helping students know how they learn and what a task demands. In doing so, students are able to set their own goals and monitor their own learning, commonly known as becoming a self-regulated learner. Applying this concept to first-year writers, Zimmerman and Bandura (1994) demonstrated the importance of self-regulatory learning to writing achievement in a study that linked self-regulation variables to freshmen students' writing grades. Their study showed that a high degree of perceived self-efficacy for academic achievement in writing positively affected the goals students set. These goals dictated the quality of writing they found satisfactory which, in turn, positively affected their grades. In contrast, neither the level of writing instruction students received nor their measured verbal aptitude were found to be directly related to writing achievement. In short, Zimmerman and Bandura found that students who believed they had the ability to learn and who believed they had a degree of control over their learning set higher goals and, therefore, achieved at a higher level.

Savion (2006) made a similar point during a workshop presented to our research group. In her research, Savion asked students to identify reasons they did poorly on an assignment or test. She found that those students who blamed outside factors—the difficulty of the course, the teacher's inability to teach, a personal problem, an illness, and so on—also lacked the awareness that the only true influence students have on their achievement has to do with variables *they* control. These factors include coming to class, reading the assigned materials, taking notes, asking questions, participating in study groups, or employing other strategies they find effective. These, then, are the metacognitive skills from which students can draw to set goals, monitor goal attainment, and, ultimately, adjust what they are doing to attain higher levels of achievement.

While these researchers helped explain student motivation as it relates to self-regulation strategies, the scholarship on reflection proved to be less helpful than expected. Instead of clarifying what prevents students from being more self-reflective, much of the literature served only to confuse the matter. Masui and De Corte's (2005) study asked business economics students to perform "reflection tasks" as a part of each homework assignment "to discover to what extent the respondents felt responsible for . . . their successes and failures" (p. 359). To accomplish this, they asked students to predict the score they would get, to "reflect on" the reasons for getting the scores they actually got, and to determine ways they could influence future outcomes based on these reflections. The researchers determined that the experimental group members taking part in these "reflective" activities were better able to attribute their success or failure to certain study skills and that these students achieved better results than did the control group members. However, what Masui and De Corte labeled "reflection" seemed to be the same as what Svinicki as well as Zimmerman and Bandura labeled "regulation." Further research showed that others equated the two skills as well. For example, a study out of Norway used group reflection on writing portfolios produced by teacher education students to improve student learning (Hoel & Haugaløkken, 2004). The researchers based their findings on a reflective method whereby students were to "look back" on an event in order to get a new perspective on it, to identify new strategies, and to then try new ways of approaching the activity that could be transferred to the perspective teachers' dealing with their future students. In short, this study described another way in which students could self-regulate their behaviors to achieve future results. In much the same way, Ryder's (2002) chapter on helping first-year composition students create reflective portfolios suggested that teachers ask their students to write a "reflective essay" that describes their progress as writers based on what they achieved in the class that term. The instructions for writing this reflective piece encouraged students to examine their various assignments to find changes that occurred in their approach to writing, to identify strategies they used that did or did not result in success, and to determine why they did or did not use these strategies in their writing. Therefore, this author, too, focused on self-regulation strategies, despite the fact that the process was labeled as "reflective practice."

Perhaps even less helpful were the studies that defined reflection as something akin to keeping a journal, a practice in recording one's "feelings" about various aspects of what they were doing or learning in the classroom (Morgan, 2003; Parkinson, 2005). While potentially helpful in certain situations, keeping a diary about learning was not my objective in requiring students to use ePortfolio for reflection. A definition of "reflection" that came closer to meeting my expectations was described on Klein's (2005) web site for art teachers at the University of Wisconsin–Stout.

She said that an excellent reflection statement will not only be well written but also **relate practice or experience to an understanding of learning; demonstrate an ability to link course work to practice; give insight, with examples, as to how learning has taken place or standards have been met; and demonstrate an ability to project future short-term and long-term goals** (emphasis added). Like Klein, I wanted my students' reflection statements to be a product of critical thinking that went beyond what they were doing in the particular course they were taking from me. This same concern was well stated by Emmons (2003) in an article describing how she reconsidered the objectives of portfolio cover letters her composition students wrote, saying:

> The development of the narrative of progress as a response strategy brings into sharp relief the limitations of our current reflective practices: while we encourage students to take an active and thoughtful role in assessing their own work, we paradoxically allow them to remain isolated from the social-interactional nature of that work. In the end, students . . . leave our classes with an overall sense of improvement but without a sense of how that improvement reflects (or does not reflect) the rhetorical demands and pressures of . . . the academic community. Thus, our reflective assignments are quickly refigured as self-reflective assignments, as occasions to consider highly personal and individual qualities and achievements, rather than as occasions to struggle with the relationships—both textual and rhetorical—that constitute writing for a particular community. (p. 44)

To remedy this shortcoming, Emmons reworked her reflective assignment to place the students' responses in the realm of academic discourse. She asked students to analyze what they learned about academic discourse in her course and then examine the changes they made in their assignments that brought their work closer to meeting the expectations of "the idealized academic discourse" (p. 54), thereby teaching them that "what counts as 'good writing' varies depending on context, goals, and community values" (p. 60). While an admirable extension of the reflective process, Emmons' revised assignment continued to place student writing in an academic context. But why limit the act of reflection to the academic realm? Isn't the goal to help students reflect on how their classroom experiences relate to life beyond the classroom? Isn't the goal to help students integrate their learning experiences? Isn't the goal to equip first-year writing students to analyze what they learned and link it not only to learning in other college courses but also to skills they will use for a lifetime, professionally, personally, and civically? At the end of the semester, isn't the goal to never again have a student ask the question I have so often heard: "Will I ever use what I learned in this class again?"

Ultimately, the literature showed that these questions are answered through how Biggs, as cited in Leung and Kember (2003), defined a "deep approach" to learning, a categorization Leung and Kember said is typically attributed to Marton and Säljö. According to Biggs, a student who "adopts a deep approach" to learning is one who:

- is interested in the academic task and derives enjoyment from carrying it out;
- searches for the meaning inherent in the task (if a prose passage, the intention of the author);
- personalizes the task, making it meaningful to [one's] own experience and to the real world;
- integrates aspects or parts of task into a whole (for instance, relates evidence to a conclusion), sees relationships between this whole and previous knowledge; and
- tries to theorise [sic] about the task, forms hypotheses. (as cited in Leung & Kember, 2003, p. 62)

The authors contrasted this deep approach to learning with that of students who adopt a "surface approach." Biggs describes such a student as one who:

- sees the task as a demand to be met, a necessary imposition if some other goal is to be reached (a qualification for instance);
- sees the aspects or parts of the task as discrete and unrelated either to each other or to other tasks;
- is worried about the time the task is taking;
- avoids personal or other meanings the task may have; and
- relies on memorisation [sic], attempting to reproduce the surface aspects of the task (the words used, for example, or a diagram or mnemonic). (as cited in Leung & Kember, 2003, pp. 62-63)

Leung and Kember's research demonstrated a relationship between students' approaches to learning and their reflective practices. They found that habitual action, in other words the routine adherence to mechanical procedure, is related to surface approaches. In contrast, true understanding and critical reflection are related to deep approaches to learning, perhaps to the extent that "a deep approach is a prerequisite for reflection" (Leung & Kember, 2003, p. 63).

The challenge, then, is to elicit this deep approach to learning and the critical reflection that accompanies it. Teaching students to recognize the learning strategies that allow them to monitor and alter their own processes for success is certainly important, but self-regulation is not critical reflection. To avoid isolating each learning experience, disconnecting it from any other they might have throughout their college years, students need to learn the skill of critical reflection. They need to see the value of their education as a whole, not only during the experience, but for a lifetime.

Methodology: Solving the Problem

To help my first-year writing students become both self-regulating and critically reflective learners, the course needed to change. Based on the work being done in the research cohort, I implemented three new strategies in an attempt to reach these goals. First, to promote self-regulation I began using surveys specifically designed to uncover the strategies students used to complete a writing assignment. These surveys were like those Swiedel (1996) reports using to help students document their study strategies in an Educational Psychology course, which resulted in improved grades after the new strategies were implemented. Colleagues in the grant-sponsored research cohort in which I participated used similar instruments with great success. Borrowing from their experiences, I created a brief questionnaire that students completed the same day they submitted a paper for grading; although each survey varied slightly, Appendix A provides a typical sample. Of the eight papers assigned, surveys were administered after the first, fourth, and sixth papers rather than after each one. This was done to minimize the time spent doing the exercise, since Sweidel's students complained about the extra time devoted to this activity. The questions focused on what goal(s) students set, when they started their task, where they worked, whether they read assigned material, whether they got their questions answered and from whom, whether they revised their papers, whether they read the instructor's comments on graded papers, and what grades they thought they would get. In other words, the surveys were designed to explicitly reveal to students what they were and were not doing to reach their writing goals; they were intended to help create self-regulated learners.

Surveys were completed the same day papers were submitted for grading. I collected the surveys and then returned them to students the class period following the one at which their graded papers were returned. This allowed the students time to read the comments written on their papers and see their grades before I employed the next step in promoting self-regulation. This step involved asking students to use the back of the survey to write responses to questions such as these: What did you learn by completing this paper? What process did you use to complete the paper and what did you learn from that process? Considering the process you used, what part of the process will you repeat for the next paper and what will you change? Such questions forced students to consider which strategies did and did not work for them as well as made them think about and record what they could do differently, if they chose to, as they worked on the next paper. At this point, I again collected the surveys so that I could redistribute them for reference during the computer lab session at which students were to upload and reflect on the paper using ePortfolio. The survey responses guided and, as we shall see later, improved the quality of their reflection statements.

While the surveys helped students recognize behaviors that did and did not work well for achieving their goals, more was needed to guide them toward deep learning. The second strategy I employed was to pose questions and lead discussions during nearly every class period that were specifically designed to help students recognize the meaning and purpose of each course activity that was undertaken. Beyond identifying course learning outcomes, the point was to help students link those outcomes to experiences outside the writing classroom. During any given class period I might ask students:

- Why am I asking you to do this assignment?
- Why am I asking you to do it at this point in the semester?
- Given your other assignments, what is the purpose of this one?
- How and why might you use this skill in your other courses?
- How might you use this skill professionally, after you graduate?
- How could this skill benefit you as a citizen and contributing member of society?

The resulting class discussions, albeit often brief, created connections for the students not only between the first-year writing course and their other college courses but between the first-year course and life beyond the university. Whenever possible, I also tried to provide a "real life" illustration of how they might use the skills they were learning outside the college classroom. For example, not long ago a letter to the editor appeared in our local newspaper regarding an action the writer claimed was taken by the federal government. Unfortunately, the writer of the letter was in error; the federal government had taken no such action. When the error was revealed, the writer admitted to unwisely relying on the Internet and the word of someone he

believed to be a reputable source of information for writing his letter. Subsequently, he retracted the letter and was reprimanded—publically—by the paper's editorial board. The reprimand included the board's refusal to accept any future letters to the editor from this particular person. The learning opportunity for students came in reading the letter writer's retraction. In it the writer apologized for not checking the reliability of sources cited in the letter, for not verifying the credibility of what had been written, and for misquoting and misrepresenting the sources. In other words, the writer apologized for not employing the very research, citation, critical analysis, and argumentation skills that are taught in the freshman composition course the students were taking. Moreover, the apologetic letter writer used the very terminology we were using in the classroom. Such "real life" examples made a tremendous impact on the students.

The third strategy used to reach the learning goals set for students was to increase the ePortfolio requirement from reflecting once at the semester's end to reflecting on each paper throughout the semester. As in the past, students were taught early in the term how to use the ePortfolio tool for uploading their papers. However, students now had their self-regulation survey, which included their handwritten comments as to what they would maintain or change for the next writing assignment, for use in guiding their reflections. In addition, during the computer lab session during which the students uploaded and reflected upon their first paper, I verbally prompted them with cues: What did you learn by writing this paper? When might you need to use this skill again? In what other courses might you use this skill? How might you use this skill after you graduate? The resulting reflections were neither shared with me nor graded until the end of the term, thereby allowing students to revise them as needed. This method was aimed at providing scaffolding for the two more difficult learner-centered principles on which ePortfolio is based: to encourage creation of a lifelong record of learning and to consistently reflect on that learning.

The critical question, of course, is whether either the surveys or the in-class attempts to make students think more profoundly about their learning had any impact on the students' ability to self-regulate their writing process and, more importantly, post reflection statements in their ePortfolios which demonstrated the deeper approach to learning I hoped that my students would reach.

Results: ePortfolio Reflection Statements

To answer these overarching questions, I qualitatively analyzed my students' reflection statements over the first eight years they were required to use ePortfolio in the freshman writing course. The first four years represent the period of time prior to my participation in the interdisciplinary research group, and the second four represent the period of time the methodology described above was used in the course. Because it was not until midway through this eight-year period that I began requiring reflections for all papers rather than just the final paper, for consistency this study analyzes the statements students posted for the final paper only. Although these reflections were not graded as we moved through the semester, during the second four years I began giving students a nominal number of points for completing their ePortfolios. The value of the requirement was intentionally kept low to avoid penalizing students for shortcomings related to using a new tool and to keep the focus of the course where it belonged: on writing well-researched academic arguments. Before writing their final reflections, students received a scoring rubric that reinforced the reflection prompts they had heard several times during the semester: Why and when did you write the paper? What did you learn by writing it? How might what you learned be useful to you in other college courses or after you graduate? Students taking the class during the second half of this study, then, had not only the self-regulation surveys but also the rubric to guide their final reflection writing.

In total eight, first-year writing sections with a registration cap of 25 students each were included in the study. Students who withdrew from the course, who did not post a final reflection statement, or who did not agree to participate in the study were eliminated. Of the 176 registered students, 78% posted the final reflection and agreed to participate in the study. Their reflection statements were analyzed to determine the average number of words written as well as the percentage that fell into each of the following categories:

1. Reflections that **only** named the final project (e.g., "Final research paper" or "This is the final paper I wrote for my freshman writing class.")
2. Reflections that not only named the paper but also added a description of the paper itself or the process used to write it
3. Reflections that identified learning outcomes of the assigned paper
4. Reflections that included statements related to self-regulation strategies
5. Reflections that included statements relating learning in this course to other college courses
6. Reflections that included statements relating learning in this course to life beyond college

Obviously students' reflection statements could include phrases or sentences that fell into any or all of the six categories, so the analysis reports the overall percentage

Figure 1
Percentage Naming Only

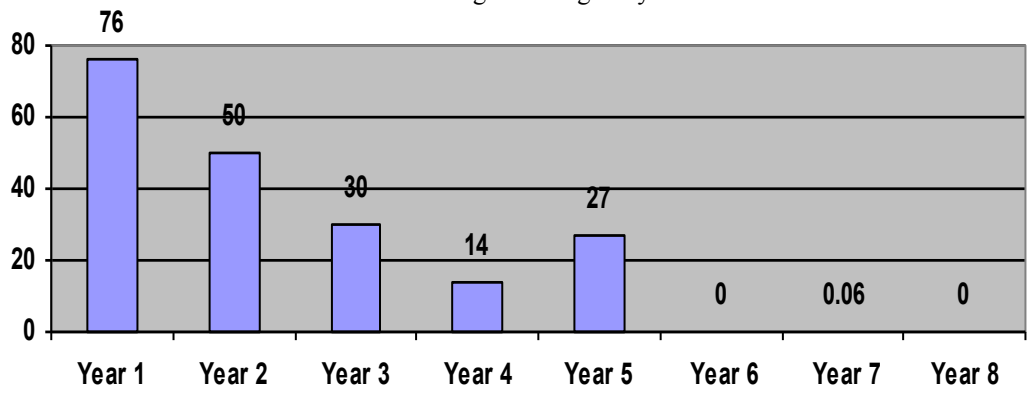
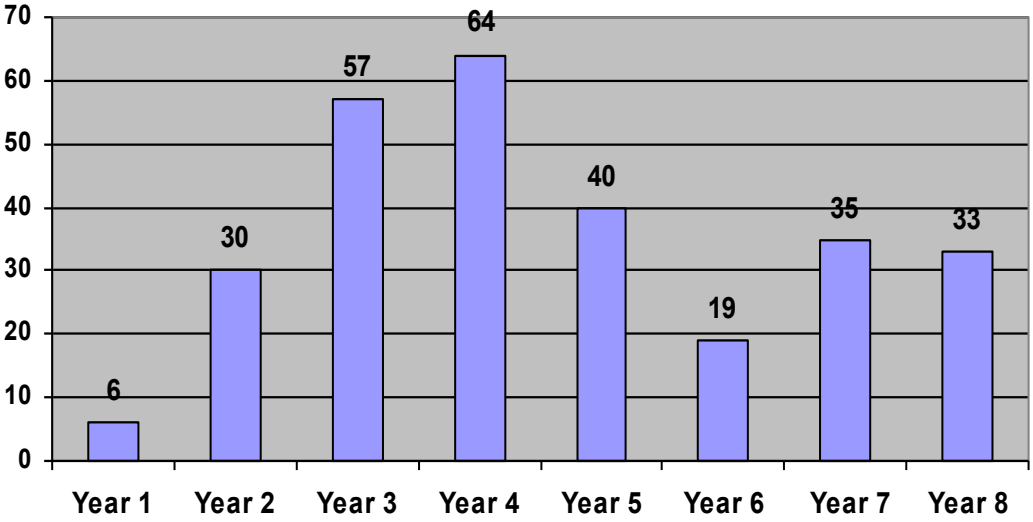


Figure 2
Percentage Naming and Describing



of reflective comments in each category. Note that each category advances the level of thinking a student would need to have done to gain insight into his or her learning, thereby demonstrating deeper reflection. The results of this analysis are discussed below.

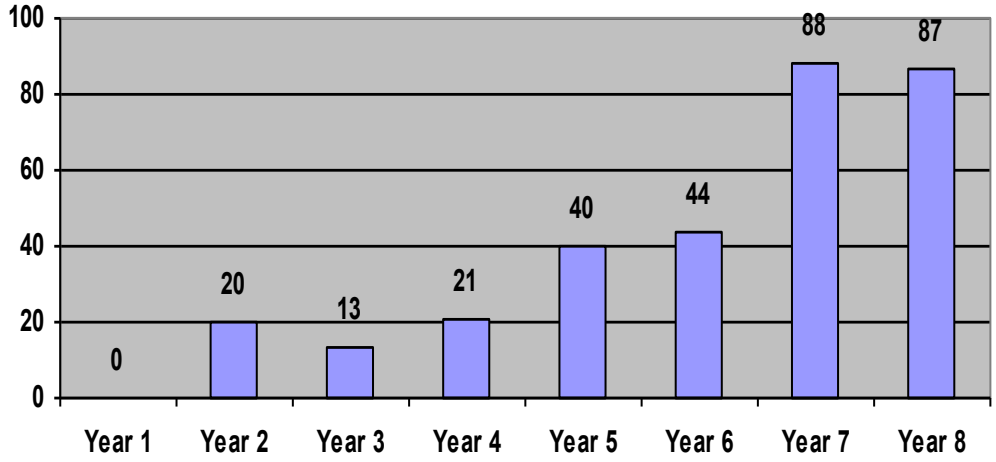
Number of Words Written

While the number of words a student writes tells us nothing about the quality of what was written, in this study it did speak to the seriousness with which students approached the task of reflection. The first year that ePortfolio use was required, the average number of words students wrote was 3. In short, students did not reflect at all. Over the next three years, the average increased to 21 words, then 33, then 39. However, once the methods used for this research project were employed, the average number of words suddenly jumped to 94 in year 5 and then to a high of 125 in year 6. The numbers leveled to 96 in year 7 and 101 in year 8. While this is still not a significant amount of writing, it does represent a significant increase in the amount of time and attention students paid the task of reflection.

Reflection Level One: Naming the Item

As discussed earlier, when students first started using ePortfolio, they tended to use the reflection text box as a place to simply name the item they had uploaded, the final research project. A typical example would read, "This paper was my final research paper." After the self-regulation surveys and classroom techniques meant to encourage reflection were implemented, the percentage of students who did nothing but name the uploaded piece dropped dramatically. In fact, over the last three years, virtually no students wrote this type of reflection statement (see Figure 1).

Figure 3
Percentage Including Learning Outcomes



Reflection Level Two: Naming and Describing

Students whose reflective thought went a bit beyond naming the item were those who both named it and then described either the paper or the process used to write it (see Figure 2). Those who described the paper would typically state the topic and, sometimes, the argument made in the paper. Those describing the process wrote statements such as, "This paper was the final try to get everything right. We had all of our paragraphs edited by classmates and teachers, and we had to make our best finished product. This paper will show how everything fell into place throughout the semester." Another student wrote, "We had been writing several papers leading up to this one," and another said, "Throughout the semester we had done prior assignments all preparing us for this final research paper." Although such descriptions probably would not benefit students' learning in the long run, they did serve to remind students of what they had done and how.

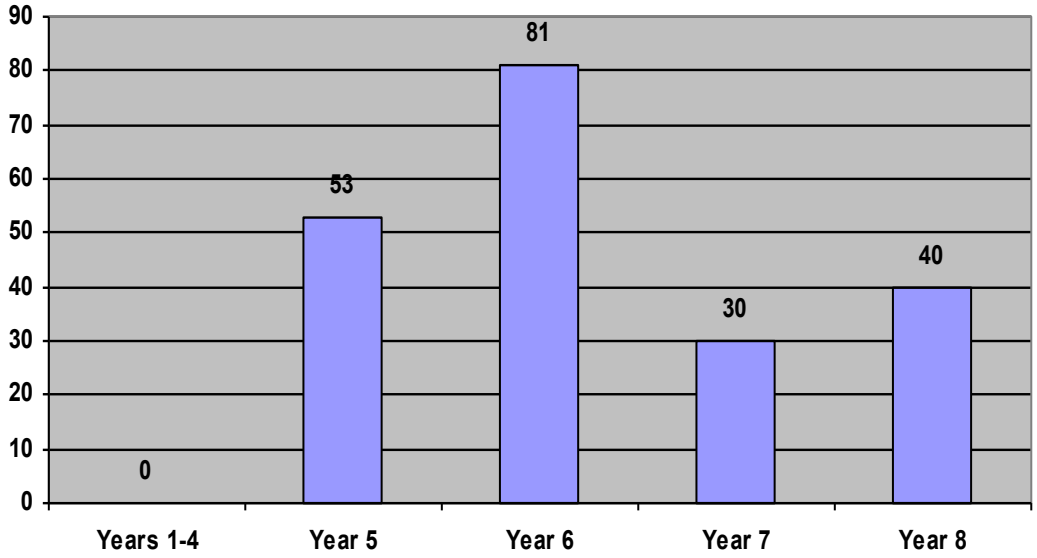
Reflection Level 3: Identifying Learning Outcomes

The next level of reflection indicated that some participants recognized the types of learning outcomes the course was designed to achieve and included them in their reflection statements (see Figure 3). This was an important leap because pointing to specific lessons learned could help remind students of their transferable skills, skills that we had discussed in class and that could be useful in any number of other situations. Sometimes the outcomes were not so much reflected upon, however, as they were listed. One student wrote, "I learned how to write argumentatively, how to analyze sources, how to research, how to use MLA citations, how to edit, how to word process, how to use technology better, how to search online, and just overall become a better writer at the college level." Other students went beyond simply listing skills to discussing higher-level objectives: "By the end [of the semester] it [the research paper] didn't really seem like a requirement as I now would like to be able to call myself an expert on the topic . . . there was a lot of research and understanding of all aspects of the data that went into the paper." Another student recognized where he fell short of the objectives and wrote about what he did to rectify the problem: "I needed to make my argument more clear and coherent. . . . [For the final paper I] changed the order of sources, explained ideas more thoroughly, and tried to make the argument as tight as possible." And one student wrote of audience awareness, saying, "I need to keep in mind that I am not writing to the teacher but to everyone." These students had moved far beyond the initial goals the surveys showed the students had brought to class, such as getting a "good" grade or finishing the task on time, thus revealing how far they had come as writers and thinkers.

Reflection Level Four: Identifying Self-regulating Strategies

Beyond identifying learning outcomes, students need to recognize that they have control over many of the factors leading to desired outcomes, whether established by themselves or instructors. At issue was whether students were able to transfer information from their survey responses into reflective insight as to what they might do differently to affect outcomes. Prior to the time self-regulation surveys were used in class, no student reflections mentioned self-regulation techniques (see Figure 4). However, the surveys proved to be quite valuable to the students, many of whom wrote reflections that stated specific actions they took to

Figure 4
Percentage Including Self-Regulating Behaviors



produce desired results after having completed the surveys. Evidence of this in students' ePortfolio final statements included, "It is amazing how much time and effort one has to put into a fully polished research paper. . . . When I write another research paper what I might do differently is spend my time more wisely." Another wrote, "I really took into account my professor's comments and my peer reviewer's comments when I wrote my finished product." In regard to asking for help, one student mentioned meeting with me to "ask for advice on creating a more coherent and stronger argument," concluding that "the conference really helped me." Finally, a student summarized the behavioral changes made this way: "I fixed or am working on my weaknesses and recognize my strengths." Despite these advances in self-regulatory behavior, as Figure 4 shows, the percentage of students including this type of statement in the final reflection dropped during years 7 and 8. While it is impossible to know the exact reasons for the decline, my guess is that the best results were obtained when I was most heavily involved in the research cohort and put the most energy into employing the strategies used to elicit change. This is an excellent reminder for teachers and students alike that desired outcomes are realized and maintained only with sustained effort.

Reflection Levels Five & Six: Relating Learning to College and Beyond

As noted earlier, over the many years I have been teaching first-year writing, a perennial question students asked was whether they would ever again use what they learned in this course. Apparently I was not teaching students about the relationships between our learning outcomes and other college courses or life beyond college, connections that may be obvious to professors but that many first-year students seem unable to make. Although time shortages made relating every lesson to applications beyond the classroom somewhat difficult, significant progress was made.

Ultimately, one-third to one-half of the students' final reflections mentioned learning that related to life beyond this one semester of instruction. For example, one student noted that the learning would be helpful "when I need to make a point to someone on a topic that is being argued. I can also use the researching skills when I get interested in something and just want to learn more." Another saw that learning "how to develop an argument and write clearly" were skills to employ "in literally every other college course taken." Looking beyond classroom audiences, a student reflected, "The skills from this paper will…help me…write for specific audiences to get my point across effectively to whoever [sic] I may be talking to." The more accomplished students were able to see that new-found skills would be useful "in the future at my job" or "just doing a presentation to a committee." The most accomplished recognized that the learning had equipped them for a lifetime: "I have learned how to be critical of a source, to analyze the material. I have learned how to ask some [of] those 'wh' questions. Why? Who said? I want proof, and if there is truth to something, then that shouldn't be a problem! In the real world I need to be able to think for myself, so learning to be critical is very important." Reflection statements such as these that

Figure 5
Percentage Relating Learning to Other College Courses

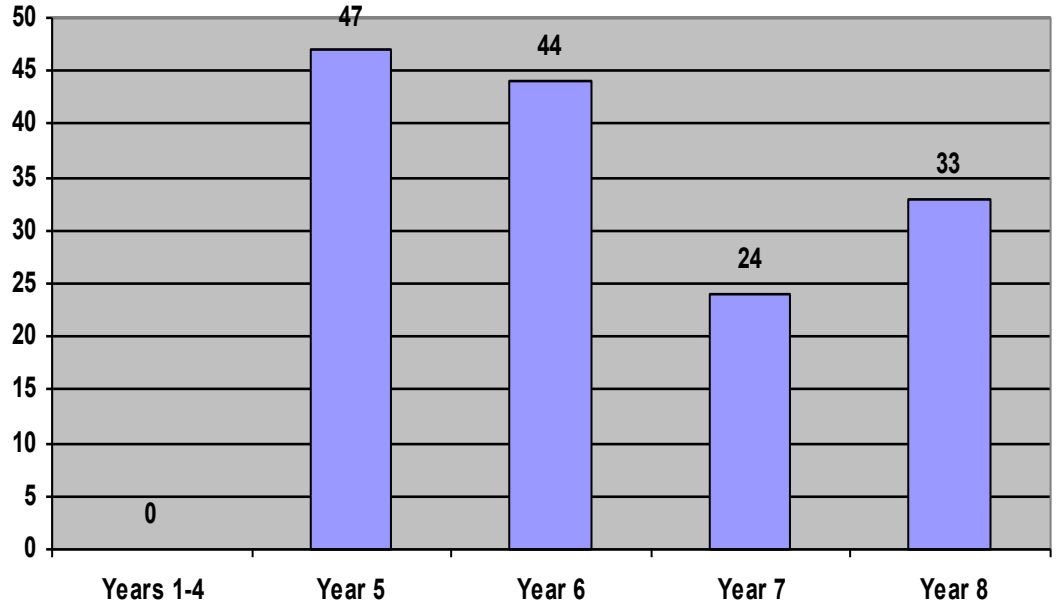
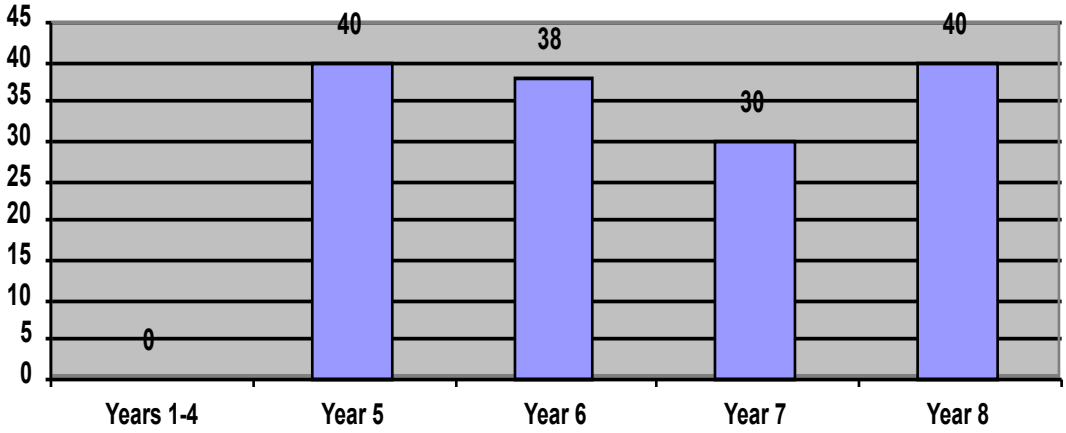


Figure 6
Percentage Relating Learning to Life Beyond College



related to college and beyond were often inextricably linked, yet they were differentiated for the purpose of the qualitative analysis (see Figures 5 and 6).

Conclusion

The strategies taken to promote first-year writing students' self-regulating behavior and deeper reflection through ePortfolio use were successful. As instructors, the first step in reaching the goal is to recognize that these are two very different objectives. Self-regulation involves helping students realize what a task demands and how they best learn so that they develop the ability to monitor their own behaviors, adjusting as needed to reach their goals. Critical reflection refers to a deeper level of learning, a level which allows the student to apply learning to practice. This deeper approach includes integrating various experiences into a coherent whole, thereby creating a fluid, rather than disjointed, educational process. The research project undertaken demonstrates that the three classroom strategies implemented to foster these skills were successful. Used in concert, the self-regulation surveys, classroom discussions and prompts, and consistent use of ePortfolio throughout the semester set students on the path to achieving the ePortfolio goals that are more difficult to obtain: creating a lifelong record of learning and regularly reflecting on learning, both at the university and beyond. The results reported here suggest that being intentional about classroom

pedagogy can indeed elicit deeper reflection. The final goal, however, is to help students reach the point when the scaffolding can be removed and students not only continue to create their record of learning but also consistently and critically reflect on it on their own. While lofty, the goal is reachable. Through persistent, intentional attention to the challenge before us, by the time our students leave the university we have the opportunity to equip them with the abilities needed to prosper in the dynamic world in which we live. It is not enough to equip first-year writing students with such skills and stop there. The next step is to integrate such efforts throughout the educational process. Only then will we truly have created lifelong, reflective learners.

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Appendix A
Paper 4: Comparative Analysis

Name _____ Section _____

After finishing any project, it's a good idea to think back on what you wanted to have happen, what you did to make that happen, and how close you came to accomplishing your goal. Paying attention to what worked for you and what didn't is the only way you can know whether you need to make changes or what changes to make. To help you do that, answer the questions below.

1. What was the most important goal you had for this assignment?

   _____ I had no goal.

   _____ My most important goal was _____.

2. In preparing to write this paper, how much of the assigned reading did you do?
   None Some All

3. How did you approach completing the draft you brought for peer review? Put an X in front of the **one** response that best describes your approach.

   _____ I started as soon as I got the assignment and worked on it steadily until it was due.

   _____ I waited until the night before the draft was due to begin drafting the paper.

   _____ I didn't start right away, but I **didn't** wait until the night before to begin writing.

4. I did most of my writing in this location: _____

5. I revised my paper (circle one) **thoroughly somewhat not at all**.

6. I paid (circle one) **a great deal of some no** attention to my peer reviewer's comments.

7. I had questions on the assignment that needed to be answered outside of class. **Yes No**

8. If yes to #7, I sought answers to my questions. **Yes No**

9. If yes to #8, indicate where you went for help (circle all that apply):

   my instructor Writing Workshop a classmate other (specify _____)

10. I have read (circle one) **none some most all** of the comments my instructor has written on my past papers.

11. Of the 100 points possible for this paper, I think I'll get about _____ points.