# More Than Mere Collections: Portfolios as Direct and Authentic Assessment of Information Literacy Outcomes

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## Abstract

*Portfolios are a direct and authentic assessment technique well-suited to evaluate information literacy outcomes. However, methods traditionally used to score portfolios present logistical issues that make them prohibitive and expensive to use. Phase 2 scoring alleviates these problems while maintaining the advantages of using portfolios for assessment. This paper summarizes the use of portfolios to assess information literacy, the problems associated with traditional scoring procedures, and the use of Phase 2 scoring, and concludes with a case study of an undergraduate applied writing program which uses portfolios and Phase 2 scoring to assess writing and information literacy learning outcomes.*

## Introduction

Many methods have been used to assess student learning of information literacy within individual courses, within disciplinary curricula, and at university entrance or exit levels. These methods include rubrics, pre- and post-tests, standardized tests such as iSkills or Project Sails, and portfolios. Portfolios are collections of student work in which a reflective statement or letter ties the content together in a way that demonstrates metacognition and learning. Through reflection or metacognition, students demonstrate their learning processes and how their performance meets programmatic outcomes. As a direct and authentic assessment measure, portfolios are well suited to evaluate processes such as information literacy.

However, despite their advantages, traditional portfolio scoring procedures present logistical issues as the depth of content in portfolios can make them time-consuming and expensive to evaluate. In addition, portfolios can be subject to scoring reliability problems. However, Phase 2 scoring procedures can be used to alleviate these problems while maintaining the advantages that portfolios present as

a direct and authentic assessment method. Under Phase 2 procedures, students compose a persuasive cover statement as an argument to demonstrate growth and performance as it relates to program goals and outcomes. Students then cite the content of the portfolio as evidence on which the argument is built. For the evaluator, Phase 2 scoring eliminates the need to read and re-evaluate the individual compositions in the portfolio. Instead, evaluation is focused on the persuasive cover statement as a rhetorical argument accompanied by evidence. As a result, logistical problems with portfolio evaluation are eliminated and reliability issues are addressed through clearly articulated outcomes and scoring guide or rubric.

This paper summarizes the use of portfolios for pedagogy and assessment, the problems associated with traditional portfolio scoring procedures, and the use of Phase 2 scoring as a valid and reliable method to score portfolios. It concludes with a case study of an undergraduate applied writing program in the United States which has developed an integrated set of writing and IL outcomes which are assessed using portfolios evaluated with Phase 2 scoring procedures. The case study includes analysis of three semesters of results and how it has impacted pedagogy and curriculum for the program.


**Portfolio Pedagogy**

Theoretically, portfolios are effective tools in a constructivist approach to education.  In constructivist theory, education is a dynamic and reflective process in which learning takes place as the learner connects thought, reflection, experience, and action over time to construct new knowledge. In portfolio pedagogy, reflection is an essential component of learning by enabling students to understand and be aware of the processes that they engage in when they learn.  Reflection also allows the student to integrate distinct works into a cohesive whole and construct links between and among artifacts and learning experiences to aid moving beyond propositional knowledge, or "knowing what," to procedural knowledge, or "knowing how" (Nicholson, 2004, p. 2-3).

As a result, portfolios have become increasingly popular in many disciplines as a method to foster student learning. Simply defined, portfolios are collections of works. More specifically, academic portfolios are a collection of selected work situated within a learning context for the purpose of demonstrating learning. Unlike professional portfolios, which typically only include examples of best work, academic portfolios may include drafts, revisions, and other process documents as well as final products. By incorporating such documents, students demonstrate learning across time and within different contexts in order to demonstrate achievement.

To accomplish this, a reflective cover statement or letter ties together the content of a portfolio so that the portfolio is more than a random collection of work. The reflective letter or cover statement turns the accumulation of work into evidence for learning by giving it meaning within the context for which it was created. In portfolio pedagogy, reflection is a key component of the rhetorical purpose of portfolios themselves. The reflective statement, along with the presentation of the portfolio, allows the author to create a rhetorically-based persuasive collection that demonstrates learning.

**Portfolios as an Assessment Method**

Portfolios are a direct and authentic method of assessment. That is, portfolios provide evaluators with the opportunity to directly assess constructs under study so that assessment results are highly valid. Unlike indirect measures such as multiple-choice tests, direct and authentic measures assess student performance to determine achievement. As such, they are an effective tool to measure whether or not students have learned and can apply learning outcomes.

Portfolios present many advantages for assessment, particularly for processes such as research and writing. Portfolios contain multiple samples of work, samples are grounded in the context in which they were originally written, students may demonstrate their processes through the inclusion of drafts and revisions, and students may show facility in more than one writing style through incorporation of multiple genres. As such, portfolios are well suited to assessment of processes such as writing and research which are more effectively demonstrated through multiple genres and over time rather than through evaluation of one final product.

Portfolios also represent a method of assessment that is consistent with constructivist pedagogy. The reflective cover statement is a particularly key component of portfolios when used for outcomes assessment. In the reflective cover statement, students evaluate their own processes of learning by placing their work in context; in the context of outcomes assessment, reflection takes place within the broader goal of demonstrating performance based on stated outcomes.

Typically, portfolios are scored holistically using methods developed for or adapted from the scoring of timed essay tests or using a scoring guide that evaluates specific traits that must appear somewhere in the portfolio. Under traditional scoring methods, raters read all of the work students include in the portfolio, requiring a significant amount of time and cognitive attention on the part of the rater. As a result, portfolios are time-consuming and expensive to evaluate given the amount of work that may be included in them. In addition, research has exposed reliability problems related to portfolio scoring. Condon and Hamp-Lyons (1994), for example, found that readers do not attend equally to texts when evaluating a portfolio, that judgments are arrived at early on in portfolio readings, and that readers then read remaining documents to confirm that judgment. Other research (Hamp-Lyons & Condon, 2000) showed that readers found short cuts when reading portfolios in order to reduce the time and cognitive load required to assess them. Traditional portfolio scoring procedures also potentially re-evaluate work that has already been graded in the context of the course for which it was composed.

To address problems with portfolio scoring and as a method more closely aligned with portfolio theory, White (2005) proposed Phase 2 scoring procedures for use in writing assessment. Under Phase 2 procedures, students compose a reflective cover statement as an argument to demonstrate growth and performance as it relates to goals and outcomes. Students then use the content of the portfolio as sources to cite as evidence in support of their claims. The cover statement, then, becomes a rhetorically-situated argument in which students have analyzed their work, made claims about their learning and achievement of outcomes based on that analysis, and supported those claims by citing the content of their portfolio. As a result, raters read

and assess only the cover statement and refer to the remaining content to confirm that students' claims are accurate.

Therefore, Phase 2 as a scoring procedure addresses the logistical issues associated with portfolio assessment. Because readers only read the portfolio cover statement, the time to read and score the portfolio is reduced significantly as is the cognitive load on the rater. As a result, issues found by Condon and Hamp-Lyons are eliminated. In addition, by focusing on the cover statement concerns about how to evaluate multiple genres of work that students may include in their portfolio are eliminated because it is the cover statement that is assessed, not the individual artifacts. Cost and resources are reduced. For the student, Phase 2 scoring eliminates the potential of double jeopardy because work which has already been graded as part of their course is not re-evaluated as part of the portfolio score. Course grades and portfolio scores can also be triangulated in a process of validation of assessment procedures

Perhaps most appealing about Phase 2 scoring, however, is that it adheres to portfolio theory and pedagogy. Because the focus is on the student's cover statement, the scoring procedure  itself is a reflection of and consistent with the pedagogy which it is intended to assess. By engaging students in the act of reflection to assess their own work within the context of outcomes, Phase 2 scoring brings students into the evaluative process.

In addition, Phase 2 scoring may have added relevance for the assessment of information literacy because it represents the construction of a statement that is a complex literacy act in which content and medium used to present it are essential to the rhetorical argument. Academic portfolios are selective not comprehensive. Students must evaluate their work in order to select the most appropriate compositions to include in the portfolio as evidence of learning.  This selection process is a literacy act: students must be able to read and assess their own writing/composing in order to make the best selection decisions based on their understanding of outcomes and scoring criteria.  By composing a persuasive statement in which they are constructing an argument with evidence, students access and use information for a specific purpose and audience.  Although this act involves their own work, it represents the construction of an argument through accessing, reading, evaluating, using, and presenting information within a specific context. Selection and organization or arrangement  of their work requires an understanding of effective information management. Presentation of the portfolio demonstrates an understanding of the relationship between form and content and how design and presentation facilitates the persuasive message. Thus, the collection and presentation of content of the portfolio represents an understanding of the use of media to present an argument effectively to an audience.

However, Phase 2 scoring is not without potential problems. Key to the success of Phase 2 scoring is that goals (outcomes) for the assessment be clearly defined and articulated so that the students' statement is focused on learning within that context. The cover statement required of Phase 2 can be difficult for students to write. Students do not typically think of their own work as evidence and may not be comfortable or familiar with how to cite their own work in support of a rhetorical argument. Students may ignore or not address goals or outcomes in their statement

for a variety of reasons. Yancey (1998) cites rhetoric and composition research that demonstrates that self-assessment is an important part of how writers compose but that instructors do not ask for it. The result is that students become dependent on external rewards (grades) instead of their own ability to judge their work. As a result, students may not be prepared to write the type of reflective statement required of Phase 2. Further, evaluators may identify differences in quality between the persuasive cover statement and the content of the portfolio raising questions about how to reconcile such differences when assigning scores (White, 2005).

Because Phase 2 is a relatively new procedure, the extent of these problems is not yet known. As programs adopt Phase 2 to assess portfolios, more will become known about its impact on the evaluation of student learning and, by extension on validity arguments prepared with the resulting data.

## Portfolios and Assessment of Information Literacy

As a direct and authentic assessment technique, portfolios represent a promising strategy to evaluate information literacy outcomes based on student performance. Portfolios provide two advantages for information literacy assessment over other methods. In addition to the discussion above about added value of Phase 2 scoring, portoflios allow research to be assessed as a process. In this context, it is important to recognize the difference between a professional portfolio and an academic portfolio. A professional portfolio, typically used as part of job application or interviews, presents an individual's best work to highlight accomplishments and skills and abilities for the purpose of being hired or winning a contract. An academic portfolio, on the other hand, is composed for the purpose of assessment of learning outcomes. As a result, students have the opportunity to incorporate drafts, journals, and other documents which demonstrate how they have engaged in a process. As a demonstration of information literacy outcomes, for example, students might include search logs, journals reflecting on search strategies and evaluation of information found, brainstorming exercises to narrow and develop a topic, and more.

Second, portfolios provide an opportunity to assess information literacy outcomes other than those associated with research. For example, students may include documents in their portfolio to demonstrate their understanding and application of information literacy outcomes related to intellectual property; privacy and security related to information practices in an online environment; social and cultural issues surrounding information; legal and other policy guidelines related to the use of information; and the organization, storage, management, and communication of information using an appropriate genre and medium.

As an authentic assessment method, portfolios accomplish or meet many of the assessment criteria of the *Characteristics of Programs of Information Literacy that Illustrate Best Practices: A Guideline* (Association of College and Research Libraries, 2003) by focusing on student performance, assessing both process and product, and including self-evaluation. They also allow for integration of assessment of information literacy outcomes with course and curriculum assessment in a way that stand alone pre- and post-tests, rubrics, and standardized tests cannot. Portfolios, then, are a direct and authentic assessment tool because the construct under study is evaluated based on student performance over time.

As portfolios have become an increasingly accepted way to assess learning outcomes, librarians have begun to experiment with their use. Fast and Armstrong (2003) used course portfolios to assess two library courses linked with disciplinary courses. Snavely and Wright (2003) used research portfolios as part of a credit course for honors students completing thesis research. The New Jersey Institute of Technology has used portfolios from four different course contexts to assess information literacy based on citation practices (Scharf, Elliot, Huey, Briller, & Joshi, 2007). Sonley et al. (2007) report on a case study in which assessment practices were revised to include portfolios. Diller and Phelps (2008) more recently report on their assessment of information literacy outcomes using electronic portfolios from the general education program at Washington State University.

All of these examples have used either trait or holistic scoring procedures, however. The Multimedia Writing and Technical Communication (MWTC) Program at Arizona State University (ASU) integrated information literacy and writing outcomes to serve as the basis for curriculum development and assessment. Outcomes are assessed using electronic portfolios and Phase 2 scoring as described in the case study below.

**Case Study**

The MWTC Program is an undergraduate degree-granting applied writing program which emphasizes instruction in the production, design, management, and communication of information. The MWTC Program is upper-division, consisting of thirty-three hours of coursework beyond ASU's general studies requirements. The curriculum was developed around four main foci reflective of an applied writing program: technical communication, visual communication, writing with technology, and technical editing. Program courses are taught both online and on campus; all required courses and the majority of electives are offered either solely online or in multiple sections with at least one online so that it is possible for students to complete the degree online.

The creation of the MWTC Program's model for integrating information literacy has been an evolutionary one built on our theoretical and practical assumptions about information literacy and rhetoric and writing. Although rhetoric and writing and library and information science are distinct disciplines, both are concerned with the mediation and communication of information. The most common connection between rhetoric and writing and library and information science is manifested pedagogically in research writing and bibliographic or library use instruction in first-year composition. However, for applied writing programs such as the MWTC Program, information literacy is equally important. Graduates of the MWTC Program work in fields as wide ranging as web development, graphic design, and instructional design as well as traditional technical writing and/or editing fields. Although diverse in nature, all of the careers our graduates enter have strong information components in common, including research, information or content management, information design, and single sourcing. The field has rapidly evolved into one that necessitates a sophisticated understanding of information.

Our model to integrate information literacy developed gradually beginning 2001 while I was librarian working in collaboration with the program and continuing

when in Fall 2004 I was hired as a full-time lecturer.  Partnership and collaboration with the MWTC Program while I was a librarian during this time period was valuable and essential to our work as it was during this time period that we began offering our first information-related courses and integrated information literacy into program outcomes (D'Angelo and Maid, 2004).

The basis of our approach to creating an information literacy infused curriculum has been the formalization of program outcomes merging rhetoric, information literacy, and technology. MWTC Program outcomes are based on the Writing Program Administrators' *Outcomes Statement for First Year Composition* (WPA OS). The WPA OS consists of four outcomes categories: rhetorical knowledge; critical thinking, reading, and writing; processes; and knowledge of conventions. In 2003 we finalized integration of information literacy into outcomes by merging ACRL *Information Literacy Competency Standards for Higher Education* (*Information competency standards for higher education,* 2000) into each of the four WPA OS categories. Once outcomes were finalized and I joined the MWTC Program as a full-time lecturer, we created a curriculum matrix to map each outcome to program courses. This matrix gives us a visual snapshot of the relationship between outcomes and courses. In addition, in Fall 2006 we implemented a new assessment strategy which reflects a recursive approach in which assessment has two goals: first, it provides to students both summative and formative evaluation of their work in the Program and second, it provides us with data with which to continually improve curriculum, teaching, and learning.  By assessing student portfolios based on Program outcomes, we are able to identify strengths and weaknesses in courses and teaching strategies and to use that information as evidence for curriculum improvement.

Our current formalized assessment procedures were implemented in Fall 2006 and continue our practice of using electronic portfolios to evaluate student performance based on outcomes.  Students compose electronic portfolios prior to graduation to demonstrate application of their learning through a reflective cover statement in which samples of their work from courses are cited as evidence to support their argument. To work on their portfolios, students enroll in a capstone course which is conducted online informally in workshop style. That is, students work through a series of tasks to help them think through the purpose of and audience for their portfolio within the context of outcomes and assessment. Faculty raters evaluate portfolios using a six-point scoring guide derived directly from program outcomes using Phase 2 scoring procedures.  Students receive a report consisting of their portfolio scores along with comments from raters. This summative and formative feedback is intended to give students an idea of how well they have demonstrated application of their learning.  However, we also use aggregated data for program improvement to identify which outcomes are strongly evident as well as which are not being met or not being met adequately.

Using Phase 2 scoring procedures, two faculty members evaluate each of the portfolios using a 6-point scoring guide. Faculty members rate each of the four categories of outcomes and along with the score write a short comment to give summative feedback to explain each score. In addition, students receive an overall comment on their portfolio from each faculty member with formative feedback. It is important to remember that using Phase 2 procedures, raters read only the cover statement and refer to the portfolio content when and if the student has cited it as

evidence for a claim in their statement. Raters do not read individual artifacts in their entirety.

In our case, information literacy is not rated as a trait. Consistent with our integration of information literacy within the MWTC Program's outcomes and within ACRL best practices for integration of information literacy outcomes with the rest of the curriculum, information literacy is assessed holistically within each of the four categories. And so, information literacy is assessed within the context of our Program and curricular goals consistent with ACRL best practices. Using portfolios we are able to assess information literacy as an integrated construct rather than as discrete skills. In addition, we are able to assess research as a process that begins with task initiation and ends with the presentation and communication of results as rhetorically-situated within the context of the task the student was assigned. In addition, information literacy is assessed as an understanding and application of conventions such as citation practices, standards and regulatory information as well as ethical and legal issues related to information including intellectual property, privacy, access to information, and more. We also integrate and assess information literacy as an information management practice so that students are expected to demonstrate the ability to organize and store information within the context of purpose.

## Initial Results

We now have three semesters of data from using Phase 2 scoring of portfolios, including scores and comments. Over three semesters, ten students submitted capstone portfolios prior to their graduation. The numbers are too small for statistical analyses at this point; however, the results for all categories fell into a typical bell curve with the majority of scores falling into the mid-range of 3-5.

The results I share below derive from a qualitative analysis of rater comments in combination with the scores for each of the ten portfolios. Currently underway is a further qualitative study using grounded theory to more closely analyze both cover statements and artifacts from the ten portfolios to triangulate the data from the scores and comments.

Based on scores and rater comments, results related to information literacy showed that students engaged in a variety of types of research. For the most part, raters commented on students' use of multiple methods to conduct research including searching for secondary sources, surveys, interviews, and observation. Scores from the two categories in which retrieval and use of information are outcomes (rhetorical knowledge and critical thinking, reading, and writing) received the highest among all portfolios. Ethical and social issues related to information are integrated into the critical thinking category of outcomes for the MWTC Program. Although a difficult category to demonstrate achievement of, scores for this category were the second highest (after rhetorical knowledge) and raters commented particularly when students discussed issues related to social, economic, or cultural issues related to the use of technology and information

However, not all the news was positive. No rater commented on or appeared to evaluate research as a process; instead assessment appeared to be focused on the end product. Whether this was due to student's failure to make claims about their research processes, failure to point to evidence, or failure to include documents that demonstrated process is unclear from this study alone. Further, no rater commented on student citation or documentation practices, again why this is the case was not determined by the study of scores and comments; however it is noteworthy that the

lowest scores among all portfolios were those associated with the category (knowledge of conventions) in which citation and documentation are a part.

Raters read and comment only on the persuasive cover statement; if students did not make claims related to outcomes that may have been evident in their artifacts, the rater had no ability to score them. In addition, the score for each category is an indication of how well the student achieved outcomes for that category. Further, if the student made a claim but did not specify how portfolio content demonstrated achievement, the reader had no choice but to conclude that the student had made an unsubstantiated claim.

In fact, lack of evidence was the most prominent comment made by raters. For the ten  portfolios in this study raters commented a total of 80 times. Twenty of those comments indicated that students did not consistently or adequately support claims. An additional 14 comments indicated that students did not support claims at all. The number of comments about inadequately or unsubstantiated claims is alarming. First, the implications for the use of Phase 2 scoring are that there are significant issues that need to be addressed for it to be used effectively.  Secondly, the cover statement is a fairly traditional academic argument of claim and support. The fact that so many comments indicate that students did not support claims adequately raises questions about how much students actually learned or how well prepared they were to graduate.

But, as White (2005) discussed in his proposal for the use of Phase 2 scoring, there are potential limitations to the method. Students are not used to thinking about their own work as "information" which can then be cited as evidence. In addition, the type of metacognition required to compose the cover statement is difficult. Coming as it does just prior to graduation, students may be not giving it the attention required to complete such a difficult task. They may also misunderstand the purpose of the portfolio as one that shows off best work (as a professional portfolio would) instead of an academic portfolio which demonstrates learning. As a last assignment, students may want to show off their work rather than incorporate work that ranges in abilities and levels of achievement.

However, what is important is to remember is that Phase 2 was designed to not only compensate for logistical problems with portfolio scoring but to do so within portfolio theory and pedagogy. What we may be seeing as limitations of Phase 2 may actually be strengths because the results provide us with evidence not only of student learning and achievement but also with evidence about how well our instruction and curriculum are working. One of the advantages of the use of portfolios is the emphasis on constructivist learning and reflection. If we value pedagogy that facilitates learning in this way, then Phase 2 is an appropriate assessment procedure to reinforce it and provide us with data to improve practices to teach it.

In fact, that is how the MWTC Program is using the results of data from our first three semesters of using Phase 2 scoring. We have added a new research course in which process is emphasized along with the rhetorical nature of research as situated within the context of the task assigned, the audience it is conducted for, and the purpose for which results are used. As an applied writing program, this grounding of research as a rhetorical  process is intended to help students reach beyond academic conceptions of secondary research towards workplace practices. Other curricular changes relate directly to communicating outcomes to students within individual courses so that by the time they reach the capstone course they

have greater understanding of what they should have learned and how courses work together as a cohesive curriculum. Faculty are asked to include course-specific outcomes from the curriculum map in their course documents. Some have gone a step further and attach outcomes to assignment descriptions so that the grading of individual assignments is linked to program outcomes assessment.

In addition, we have made changes to our capstone course which helps prepare students to compose their cover statement and compile their portfolio. Among the changes, students now complete several activities in which they read and analyze the outcomes and then use a spreadsheet or table to categorize assignments from their previous courses based on their understanding of specific outcomes. We hope that this gives students a more formal and structured format for assessing their own work that then translates into their cover statement. In addition, we are now requiring students to compose drafts of their cover statement. Drafts are then peer reviewed so that students engage with each other, help each other understand and analyze their work, and encourage one another.

Further, the author of this paper is currently engaged in a grounded theory study to more closely analyze the cover statements and artifacts in the same ten portfolios reported on here. Through closer analysis of the portfolios, I will triangulate the data from the analysis of scores and rater comments. In addition, I will more fully investigating the types of research processes that students engaged in and how they are embedded in rhetorically-situated tasks.

## Conclusion

Phase 2 is a viable portfolio scoring procedure for assessment of information literacy outcomes.  Consistent with portfolio pedagogy and learning theory, Phase 2 scoring reinforces metacognition and student reflection about their own learning processes and performance.  In addition, the results of Phase 2 scoring contributes to our understanding of our teaching and learning practices to inform us about areas that are working well and areas that need improvement.

In practice, however, the use of portfolios and Phase 2 scoring requires preparation prior to implementation. Outcomes that will be assessed must be clearly articulated so that both students and raters understand what is being evaluated and, therefore, what should be included in the reflective cover statement.  In the scoring guide or rubric used to assess the portfolio cover statement, criteria must be clearly linked to outcomes.

In addition, students must receive assistance with writing their statements and preparing their portfolio. As indicated by the results of this study and others (Bower, 2003; Costello, Hudson, & Leathers Dively, 2008), many potential pitfalls exist for the use of portfolios and Phase 2. Students may misunderstand the purpose of the cover statement, may consider it an added on activity that they do not pay attention to. Further, students may have difficulty assessing their own work in the context of evidence for an argument for their learning. The task on the surface seems like a simple one: write an argument about one's learning and support it with evidence from your own work. However, in practice the task is quite difficult and requires cognitive skills which students may or may not have had the opportunity to learn in courses.

Lastly, we must view results of assessment as evaluation of our own teaching and curriculum as well as of student achievement. The power of Phase 2 scoring of

portfolios is that it shows us how well students are able to apply what they have learned so that we can determine if information literacy outcomes have been achieved.  The further power of using Phase 2 scoring of portfolios is that it provides us with data with which we can assess ourselves and our teaching practices. If we value constructivist learning and helping our students to be lifelong learners, then the use of portfolios with Phase 2 scoring is an effective, direct, and authentic method to determine how well we are doing so and to provide us with the information we need in order to improve.

For information literacy in particular, portfolios are a way to ensure we meet outcomes assessment based on ACRL best practices so that information literacy outcomes are not assessed as discrete skills but as abilities and knowledge areas in the context of the curriculum. In addition, portfolios allow us to assess research as a process in a way that standardized tests, analysis of citation practices, pre- and post-tests cannot. Portfolios also allow us to assess aspects of information literacy that typically are over-looked or subordinated to research so that information literacy can be seen within its full scope rather than narrowly defined as searching for and finding information. Further, Phase 2 scoring emphasizes the importance of information literacy. The composing of a persuasive cover statement using one's own work is a sophisticated use of information. Although the information in this case is the student's own work, the ability to identify, evaluate, and cite that information is an information literacy skill. Lastly, Phase 2 may push students towards recognizing that their own work is not simply an end product of a course assignment submitted for a grade. It is information that is potentially part of the conversation of knowledge building and creation and not isolated and discrete product creation.

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