

Studies in metacognition and the benefits of developing students' metacognitive skills are beneficial to rhetoric and writing studies. They assist in identifying strategies, and pedagogical choices that not only help students improve their metacognitive skills, but assist instructors in deploying similar metacognitive approaches to their teaching practices. However, understanding the importance of developing the metacognitive skills to improve understanding of concepts, and develop better study habits of students is only one part of the many complex issues writing instructors face in the classroom. In the writing classroom there are many other skills that need to be developed, such as metalanguage, and developing digital multiliteracies. Therefore, to incorporate strategies that develop those skills in the writing classroom instructors must multitask. In addition to the push to embrace the self-reflective nature of metacognition in reflection assignments, writing instructors face the pressure of adding assignments that also develop and build upon the digital literacies of students. Simply put, there is little time in a semester to achieve many of these goals. Currently, the direction of research is split. Metacognition is used in developing meaningful reflection assignments, but these assignments are mostly composed as alphabetic texts. This paper aims to demonstrate the usefulness of combining reflective assignments with multimodal compositions to encourage students to use and further develop their digital metalanguage by researching the following questions.

What is the importance of metacognitive studies in RWS?

How can instructors develop metacognitive skills of students and digital literacies?

What is the impact of students composing self-reflection assignments using multiple modes?

The first section of this paper sets up metacognition as the theoretical framework of self-reflective multimodal composition assignments deployed in the writing classroom. The next section will offer additional theoretical approaches to developing these assignments, and the final section explores the practices and patterns found in the work of students composing these self-reflective multimodal assignments. The goal of this paper is to demonstrate the ways in which metacognitive skills can assist in the development of digital literacies, and student self-reflection in an effort to establish better study habits through the use of digital multimodal compositions.

D.J. Hacker (1998) aims to work through the many definitions of metacognition. His purpose in writing is to "cut through the fuzziness surrounding the concept by describing the characteristics of metacognition that have remained relatively constant across disciplines" (p.1). Hacker focuses on Flavell's work to review the ways in which metacognition operates and has been researched. The basic notion that Hacker presents to the reader is that "metacognitive thoughts do not spring from a person's immediate external reality," and that "their source is tied to the person's own internal mental representation," so then their source is tied to the person's own internal mental representations of that reality" (p.2). This is helpful to instructors if their goal is to create assignments that deliberately appeal to a student's internal representation, and/or encourage students to foster this type of metacognitive development. It is important for students to think about their thoughts, what they know, and what is their current problem. This type of metacognition, according to Flavell (1979), is based on "knowledge and cognition about cognitive phenomena" (p. 2). Hacker through Flavell (1971) explains that this type of metacognition is "an awareness of oneself as an actor in his environment, that is, a heightened sense of the ego as an active, deliberate storer and retriever of information" (275). The clearing up of metacognition as more than thinking about thinking is useful when relating that information to pedagogical practices. Hacker, after clearly defining and explaining the purposes of the definitions he uses details a research study that follows the metacognitive practices of a

high school student. The outcome of this study demonstrate the ways in which one uses what they previously know, what they want to know, and how the student made connections between the two to solve a problem. It is important to note that these metacognitive practices are conscious practices, and that this general understanding and definition is aimed at providing an “overall view of the kinds of processes that have been associated with it” (p.6).

Building on these concepts is Kluwe who refines metacognition by drawing attention to two characteristics. According to Kluwe (1987), “the thinker knows something about his or her and others’ thought processes, and the thinker can pay attention to change his or her thinking” (p.610). The importance of this is that students that are aware of their own thinking, and others, can use such knowledge to improve their thought process, which means that the social aspect of learning is equally as important as the internal. Downing et al (2008) use Brown (1987) to support this by stating that “metacognition requires the thinker to use and describe the process of mental activity” (p. 610), and use Hacker’s work (1998) to divide metacognition into three categories. The first deals with metacognitive knowledge as what one knows, metacognitive skill as what one is currently doing, and metacognitive experience which is one’s current cognitive state. Downing et al. use metacognition as a framework for studying problem-based learning. Their aim is to understand ways in which students approach problems that need to be solved. Therefore they suggest that “in order to effectively solve problems, students often need to understand how their mind functions.” They need to be able to “perceive how they perform important tasks” (610).

To develop metacognitive skills, Ganz and Ganz (1990) state “success should not be defined solely from the standpoint of student mastery of the subject matter, but rather from the perspective of helping students” (180). They encourage an environment, teacher, and curriculum that “develop a major self-control process, metacognitive skills processing” (180) to aid the student. The fact that instructors help shape metacognition demonstrates the importance of using it as a framework. Learning should be efficient, and accompanied with a teacher that plans for such development. Their work specifically speaks to assignments, and pedagogies of teachers that will be able to alter the changes in study habit. The goal is to push students toward not merely thinking about thinking, but thinking about their own learning. Therefore, teaching about this process “should not be random,” (181) because the students that develop these skills, and understand their own learning process, but the process of others through comparison, are more likely to “make the changes needed in their own study habits and learning strategies” (181). Ganz and Ganz view self-interrogation as an important technique to develop metacognition. They suggest that asking students to question themselves, assess their feelings, and hypothesize assist students in being able to develop, and ultimately use a self-correction strategy. This also allows for students to mix previous knowledge, or existing information, with new knowledge gained, or desired. Students that assess their feelings can also demonstrate their comprehension, and what they have learned, and/or are learning. These are not feelings based on value, or what they perceive as the importance of an assignment. Rather, these are questions that address the assignments, or goals, of the students in relation to completing an assignment, or task. Their examples are “Can I make some generalizations?” and “Can I draw some conclusions?” and “Is this similar to what I already know,” (182) which clearly demonstrate how students arrive at conclusions based on what they are thinking, and understanding.

They also bring in Bransford (1979) to incorporate ideas of self-testing and rehearsal, which details the ways in which these practices assist in the transfer of information from the short-term memory to the long-term memory. These repeated practices of self-testing, and

rehearsal can then be part of the information retrieval process during phases of metacognitive practices done by students. Through their research Ganz and Ganz ultimately come to the conclusion that independent and efficient learners are “the key to better education for the complex world of the future” (184). Metacognitive skills play a large role in assisting students as they develop self-regulation strategies. They view the individual as an important role player in their learning, but equally as important is their understanding of their learning processes through metacognition. Therefore, the role of the teacher as the individual that develops and creates tasks, and assignments that both teach and improve metacognitive skills must always be aware of what questions to ask students, and how their students think through these problems, because students that are able to describe their thinking processes have developed the metacognitive skills to do so.

In composition classes the self-reflection assignment requires metacognitive skills. Some of the goals of the reflection assignment is to encourage students to assess what they learned by way of critical thinking, address progress, and be critical of their literacies. However, before students can assess what they learned, they must think about their process. Simply put, they are asked to assess what they knew during the process of completing a composition, what they had to learn to complete it, and how what they did to obtain that knowledge. These demonstrations of knowledge must incorporate the three categories Hacker created. Metacognition is implied within the self-reflection assignment, but composition instructors incorporate other elements and approaches.

NLG (1996) present an overview of the changes in the environment students and teachers face. They appeal to instructors to form new pedagogical practices based on the new multiliteracies. Their focus is one of design. To them global practices have changed, as a result the role of schools has also been altered, so they wish to “broaden understanding of literacy and literacy teaching and learning to include negotiating a multiplicity of discourses” (p.61). They urge instructors to rethink what they teach, and the new learning needs of students. Ultimately they see the changing environments as demanding that students develop new skills, and access to forms to “learn the new language of work” (67). A clear focus of their work is the notion that we are designers and understanding elements of design are crucial to helping students understand how to design in all aspects of their life. What students need is a developing a metalanguage based on design, and how this is accomplished is through understanding and utilizing the elements of design in different modes. The work of the New London Group in different modes, design, and multiple literacies is built upon by Selber in his book. His book is directed more at a rhetoric and composition audience.

Yeancy (1998) addresses reflection in her book *Reflections in the Writing Classroom*. She views reflection in writing as a growth of consciousness, and a means of going “beyond the text to include a sense of the ongoing conversations that texts enter into” (p.5). Reflections have more value than simply pushing students to develop metacognitive skills, and assess their literacies critically. Yeancy suggests that the student reflection also recovers what she calls “student talk,” which she defines as a part of the reflection process that asks students to participate with instructors as active participants in their learning. She defines reflection as a “processes by which we know what we have accomplished and by which we articulate accomplishment, and the products of those processes” (p.6). Yeancy’s view of reflection as a dialectical process that develops the way we, students and teachers, achieve goals for learning, strategies that help us reach those goals, and the ability to determine if we have met these goals. In addition, reflection includes the processes of projection, retrospection, and revision. Multiple

perspectives are in play. Two of which are reflection-in-action, which is focused on a single composition, and constructive reflection, which is a product of successive composing. Reflections are often a companion to a completed assignment. Yeancy urges instructors to either direct students to explicitly think the completed text as a task/problem worked through, and/or de-mystify the reading and evaluating of a text. Students compose reflections in their native language, and these language practices are a combination of their discourses that they bring into the classroom with them. This approach to student reflections as a composition made up of students' native language allows for instructors to embrace this assignment as something that can move beyond alphabetic text. Simply put, for the digital native, this assignment should be inclusive of the many different modes students compose in.

Selber in his book *Multiliteracies for a Digital Age* (2004) investigates computer literacy in higher education. He directly discusses the obstacles literacy practices face due to technological myths, and the creating of both writing environments and computer literacy objectives without the consultation of writing instructors. He calls for educators and institutions to take a postcritical stance toward technology, because in doing so he believes a "computer literacy program that is comprehensive, innovative, and relevant" will come about (p. 7). The main framework Selber presents three types of digital literacy, functional, critical, and rhetorical, that students should develop. Part of this development is based on viewing technology, and/or software as more than a tool, and to reflect more on the technology they use. Critical literacy pushes students and teachers to ask why and how technology is used, and designed, to control, persuade or direct them to use it for only a specific purpose. Selber's work is crucial in building on the idea that we all function in a world where multiple digital literacies are necessary.

In addition to developing multiliteracies J.E. Porter stresses that more importance must be placed on delivery, the cannon that tends to receive little attention in rhetoric. **Porter** (2009) in "Recovering Delivery for Digital Rhetoric" pushes us to put more importance on the ignored cannon of delivery. The reason for this, according to Porter, is that delivery is too often treated as superficial. Porter views the thinking surrounding delivery as functional. Delivery needs to be viewed more critically, and approached accordingly because it is important to understand how the "range of digital delivery choices influences the production, design, and reception of writing" (208). Understanding these ranges are essential to writing. Porter presents a theoretical framework that demonstrates the ways in which digital delivery is made up of five components. Each of these components operates in different situations that help you write, because the format of each can serve as a guide. Body/Identity, Distributin/Circulation, Access/Accessibility, and Economics are the five components that are elements of delivery. These elements must be addressed to reach a deeper critical thinking regarding delivery. These elements are also crucial in developing skills to become an effective digital writer; because knowing which element will serve you based on the purpose and audience you're delivering them.

In addition to Porter's work in delivery is N. Katherine Hayles' book *How We Think: Digital Media and Contemporary Technogenesis*. Hayles explores the ways in which we think not through media, but alongside it. This means that we all participate in technologies that make use of digital delivery. Therefore, as scholars, we must engage with, and conceptualize the implementation of research projects that make use of digital media. Her book is aimed at a digital humanities audience, but has value in rhetoric and writing studies. She stresses that we must continue to work collaboratively, both with co-workers and students, to locate the ways in which much of the digital work with print traditions. Her work helps to conceptualize the role of digital media and its effect on mental processes.