Teaching APA Style Documentation: Discovery Learning, Scaffolding and Procedural Knowledge

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Students struggle with learning correct documentation style as found in the Publication Manual of the American Psychological Association and teachers are often at a loss for how to best instruct students in correct usage of APA style. As such, the first part of this paper discusses the current research on teaching documentation styles as well as the learning theory behind discovery learning and scaffolding and advocates for using these lenses to address student problems with APA style. The second half of this paper provides practical exercises (called microthemes), grounded in sound pedagogy, that instructors can use in both a traditional ground classroom or in online and blended instructional models. This paper is aimed at not just instructors in a composition or research methods course who regularly teach APA style to students, but also to the frustrated psychology or science teacher who finds student submissions riddled with APA errors.

Accountability, as a watchword, has gained a great deal of attention in higher education in recent years, especially in relation to student success and academic honesty. In many classrooms and at many institutions, there may be a heightened sense of attention to common documentation formats such as APA style, as detailed in the Publication Manual of the American Psychological Association. This may stem at least partly from the fact that the ecology of higher education is affected by ease of access to information, for both good and ill. Learners no longer have to visit a library physically; they can find information just about anywhere on the Internet, and universities have responded by using the same technologies to hold students accountable for their use of information. Companies like Turnitin.com offer tools that report matching material almost instantaneously, though those tools are not perfect. Documentation formats like APA become the "language" a student must use to communicate academic honesty, heightening the importance that teachers teach it well so that students can protect themselves. Stressing to students that employing correct APA formatting can keep them from charges of inadvertent plagiarism is one way instructors can drive home the importance of the

task. However, teaching and learning APA can be frustrating.

There are too many rules for learners to remember, and teachers often want both accurate documentation and a reduction of technical errors that come with that documentation. APA format is important to teach because it provides students with a way to reduce negative attention to their work, but it is also not easy to teach. The problem is that there are at least three types of knowledge that one must have to use APA format successfully—factual, conceptual and procedural--as well as a great number of hidden details that fit into those types of knowledge.

Several empirical studies, each of which relies on some degree of discovery learning, have investigated approaches to teaching APA format. However, those studies do not make the learning process visible, and they were not meant to elucidate the types of knowledge students must possess to use APA format successfully. Thus, they provide little direction for developing a successful lesson plan. We would argue that teachers must turn to theories of learning for that. This paper serves as a guide to help instructors to make choices about the features of APA format they would like students to learn,

develop lesson plans that rely on scaffolding, and provide students with opportunities for discovery learning. Although previous empirical studies are important because they help us understand how successful particular assignments related to APA format have been, theories provide teachers with insights into the process of learning APA format that can also help students succeed.

Additionally, there is also the problem of learning modality. Many institutions of higher learning are utilizing non-traditional methods of learning (such as fully online classes) to reach new populations of students, and they continue to explore various combinations of the traditional modality combined with online components. For example, some institutions rely on hybrid models of learning, in which a class meets face-to-face once per week and participates in an online component at other times during the week. Recently, our university has begun exploring a blended learning model, in which one traditional class period is held each week, while an optional second class is held each week that relies heavily on group assignments in its learning management system. Previous studies about learning and teaching APA format also have not taken modality into account, though it is an important factor to consider because a learning modality affects the interaction between instructors and students, as well as between students and groups of students. A theoretical foundation for teaching APA format could inform instruction in these and other modalities.

This paper will begin with a review of literature and discussion of the contributions that empirical studies have made to our understanding of learning APA format, followed by an overview of learning theories behind scaffolding, discovery learning, and procedural knowledge. In addition to a discussion of APA format and the factual, conceptual and procedural knowledge required to use it successfully, we will provide examples of activities we believe will help students use APA format with greater (but not perfect) facility. Ultimately, this theoretical study aims at the application of discovery based and scaffolding learning theory to assist students in documenting their sources so that instructors can access sources from the information students provide, and to help students make informed choices while citing sources. Additionally, we hope it will serve as a starting point for further empirical research on best practices in teaching documentation in both traditional and non-traditional learning modalities.

TEACHING APA FORMAT

Much of the literature about teaching APA format to students focuses on empirical experiments that identify problem areas and attempt to teach students about them. The literature has explored student and faculty frustration with APA errors in in-text citations and the reference page. There has also been some exploration, mostly in library publications, about students struggling with finding sources and making sure sources are authoritative and reputable. One area that has been neglected in most discussions of student's experience with APA and documenting is that in this world of various media sources not everything has an obvious citation. Whereas in years prior a reference page might have just encompassed books and journal articles, today various web resources offer students reliable and compelling information. The question then becomes how to correctly document these sources. We have seen in our own introductory undergraduate composition classes that this struggle to categorize and ultimately cite a source can cause frustration and confusion in students. Rather than view this as a bad thing we have explored how this struggle to learn and categorize is actually a very positive learning experience and may even in the long run be more useful than just producing the correct citation itself.

In "Citing Secondary Sources: Can We Correct What Students Do Not Know?" Froese, Boswell, Garcia, Koehn, and Nelson (1995) studied the effects of direct instruction in APA format on twenty-six college undergraduates. Using a pre-test, direct instruction, and a post-test identical to the pre-test, they found that their methods of direct instruction increased student performance on the post-test. In addition to the testing materials, their direct instruction materials included a lecture, sample literature reviews, descriptions of citations for in-text and reference citations, and an "extensive worksheet" that included an opportunity for students to "reconstruct the source of the distortion" of information from research that was cited incorrectly on the worksheet (p. 236-237).

Focusing on both templates and checklists for teaching APA, Franz and Spitzer (2006) also uti-

lized a pre- and post-assessment with instruction between. In their study of 43 undergraduates in two laboratory courses, they used templates on their own, a checklist on its own, and both together. Direct instruction also included copies of a journal article abstract and book abstract, while students were asked to use those materials as sources to write a short paper that simulated a longer work in APA format. This sequence of instruction also included feedback from instructors on students' short papers. They found that "students using either technique [template or checklist] improved considerably, although the skill with APA style improved more with the template than with the checklist" (p. 16). However, they also found that students improved even more if both the template and checklist were used (p. 17).

Smith and Eggleston (2001) focused their study on the use of APA Style guide itself. In their study, they asked 18 undergraduate students enrolled in a research methods course to locate errors in APA formatting in an actual student paper, which had been altered by the authors to contain a variety of errors, both technical (like running heads or in-text citations) and stylistic (such as sexist language). In their sequence of learning activities, they included a lecture first, a pre-quiz three days after the lecture, a copy of the sample paper (with instructions to use the APA Style guide) five days after the lecture, and five days to correct the sample paper. Student performance on APA format was assessed by looking at students' own research papers, and the students also took a post-activity quiz. These researchers found that performance on the post-activity quiz increased. This study tries to correlate students' performance on the APA activity with their performance on their own research paper, but that seems tenuous; Smith and Eggleston admit that there are a lot of limitations to their study because there are so many variables involved.

The three studies above offer important insights into the effectiveness of their experiments and they make explicit the materials they used to achieve that success with their students. However, because the studies are empirical, they also efface important aspects of the task of learning APA that may have contributed to the students' success. While successful learning can be measured by their results, those results do not provide teachers with a clear path toward constructing new discovery learning activities that help students use APA format successfully. Initially, one might believe that the product of the authors' lessons and their quantified results (which represent finished products) render invisible the procedures that the teachers went through to develop the lessons and the cognitive processes that successful students followed. In other words, it is also important to make explicit aspects of knowledge that will help teachers and students write assignments about APA format and fulfill them successfully. The studies we have reviewed above prompt us to seek learning materials and activities that lead to those positive results. It is our contention that applying learning theory, particularly discovery learning and scaffolding, can supplement empirical research, which has tended to obfuscate how the students learn from the materials in the studies.

LEARNING THEORIES: DISCOVERY LEARNING, SCAFFOLDING, AND PROCEDURAL KNOWLEDGE

Jerome Bruner, whose theories in educational psychology and cognition are foundational to the field, advocated for discovery learning. He found that active student engagement was more important than teacher explanations. Discovery learning, wherein a teacher provides an example and then students work with those examples to understand the underlying rules and mechanisms of the concept, was Bruner's key to effective learning and understanding. He argued that the "self-propelled" (p. 22) learner, as he called students engaged in discovery learning, can use and apply knowledge with facility in problem solving when the information they learn is acquired in an active and constructionist way (Bruner, 1961). In the years since Bruner's theory of discovery learning, much research has focused on the techniques and benefits of this type of active learning. In a meta-analysis Alfieri, Brooks, Aldrich, & Tenenbaum (2010) found that a "review of the literature suggests that discovery learning occurs whenever the learner is not provided with the target information or conceptual understanding and must find it independently and with only the provided materials" (p. 2). Furthermore Alfieri et al. found that providing direct and explicit explanations on how to successfully complete a task is not nearly as effective as a method of guided discovery where learner construct their own knowledge with minimal guidance.

Discovery learning might be thought of as the counterpart to (or perhaps even the potential result of) scaffolding. Whereas scaffolding includes the support for the learner—the limiting of tasks and the supplying of information by the teacher—that is meant to help the learner focus on a certain task, discovery learning is the opportunity for the student to focus on that given task. Using the analogy of construction, Holton and Clarke (2006) explain that scaffolding is a secondary structure that both supports workers and allows them to access additional places that they could not with its use; scaffolding as implemented in a classroom does the same for learners in a cognitive sense.

The term scaffolding is an apt descriptive metaphor that elucidates not only Lev Vygotsky's theory of the Zone of Proximal Development (ZPD), but also the teacher's role in helping students work in their ZPD. In the world of construction, scaffolding is a temporary, movable structure that can be placed and replaced where and when it is needed. If the full "task" is to build a brick wall or paint the trim, a series of sub-tasks are needed to complete the larger task. In the case of brick work, for instance, a bricklayer can complete some of the tasks without scaffolding, such as mixing the mortar or placing the first several rows of bricks. At some point, however, the bricklayer will need help. Perhaps the architect asked for a 4-foot by 6-foot section of decorative brick that begins 10 feet off the ground on the north wall. The scaffolding would need to be adjusted and moved to accommodate that request.

Similarly, in a classroom setting, the teacher must be cognizant of the parts of a task beyond the students' reach, while prioritizing those tasks. George Hillocks, Jr. (1995), a researcher in writing pedagogy, calls this "structural support," which he defines as "the provision of aid or the restructuring of the task so as to reduce its complexity while retaining its essential features. . . . Although some part of the task is taken over by the instructional environment, students must still use key strategies demanded by the task" (p. 62). This act of restructuring requires a considerable amount of decision making on the part of the teacher, who must understand the variety of constituent parts of a given task, as well as students' current knowledge of that task. Although it is not obvious at first, APA format requires a surprising variety of smaller tasks that lead to a document with its required layout, citations, and writing style.

Teachers have a variety of resources to choose from as they construct classroom activities for teaching APA format, but they must also discern the steps a student must learn to cite sources correctly. The literature prescriptions for addressing APA errors include the use of the APA style manual (Smith & Eggleston, 2001), focus on direct instruction of correct format (Froese, et al., 1995), the use of templates and checklists (Franz & Spitzer, 2006) and rubrics and feedback (McDonald, 2011). It is our contention that a greater emphasis on the procedures that lead to good APA formatting are also an important part of using APA format, and thus they should be built into any discovery learning activity written with the intention of teaching APA. Experts agree that not only factual and conceptual knowledge about APA format is important; procedural knowledge is key.

For example, Daniel Willingham (2009) defines procedural knowledge as "knowledge of the mental procedures necessary to execute tasks," explaining that "having the appropriate procedure stored in long-term memory helps a great deal when we're thinking" (p. 16). The research of Schneider, Rittle-Johnson, and Star (2011) has found that just focusing on solely conceptual or procedural knowledge is ineffective; rather, the use of procedural knowledge allows students to deepen their knowledge and understanding of concepts. In other words, procedural knowledge is a crucial part of learning, thus making it important to make procedural knowledge of APA format visible for students.

SELECTING TARGET KNOWLEDGE

Students struggle with APA formatting and instructors struggle with how to best help them and with deciding which issues to spend classroom time addressing. To the extent that various types of knowledge are needed to use APA format well, students may struggle because they are not familiar with the details that comprise APA format or the pattern of thought one must follow. It should not be surprising that, "for many students mastering the appropriate editorial and writing guidelines specified in the Publication Manual of the American Psychological Association remains a struggle"

(Smith & Eggleston, 2001, p. 108). APA style, as with any specialized documentation format, presents a variety of obstacles to learning that are not easy to address. One is that there is a great deal of factual knowledge one must command (though not necessarily memorize) to use APA format effectively. All of the particulars that come with in-text citations, reference citations, layout, or writing style have important functions, but there are too many of those for even seasoned academic writers to memorize effectively.

While it is easy to recognize the common punctuation marks that APA style uses, in-text and reference citations use punctuation differently than English does, so punctuation "means" something different in APA format. Additionally, there is the conceptual obstacle in that students are not likely to be familiar with the largely unwritten procedures one must follow to use APA format well. For example, one must be familiar with a variety of written and electronic genres to classify sources correctly, and the genres of documents—especially online documents—are evolving rapidly. It may be difficult to distinguish a "web video" from a documentary that one watches on the Web. If students do not know that academic journals can be paginated either by issue or volume, or where to look to find that kind of information, their efforts are likely to be stymied.

Many of the difficulties listed above may make it challenging for students to cite sources in a way that makes them easy for an instructor to find. In addressing this problem, the Publication Manual of the American Psychological Association (6th edition) states in the preface to the chapter on Reference Examples:

> The most common kinds of references are illustrated here. Occasionally, however, you may need to use a reference for a source for which this chapter does not provide specific guidance. In such a case, choose the example that is most like your source and follow that format. …. When in doubt, provide more information rather than less. Because one purpose of listing references is to enable readers to retrieve and use the sources, most entries contain… information necessary for unique identification and library search. (p. 193)

Ultimately, two things matter when citing: one,

does the reader know where the writer found it and two, does the reader know exactly how to access it based on the information provided on the reference page. These two fundamentals are often overlooked as the true point of citations over an emphasis on the nuances of punctuation or correct italicization. Problematically, often fulfilling both those requirements will not yield the same answer. For example, students in a Composition II class taught by the authors struggled with proper crediting of a reprinted article in their textbook which, on the face of it should not be too difficult (according to the Manual, a chapter in an anthology should work) but at the bottom of the first page of the essay it stated in bold text that this article was originally published in the New York Times. Suddenly a straightforward citing task became murkier. Cite the text or the Times? The text is where the writer found it but the New York Times is more likely where the reader would go to find it. Use the textbook publication date or the original print date of the article? And this example is just from the print world. Citing in the digital age adds more complexity and more questions that do not always have clear, easy answers.

EXAMPLES OF ACTIVITIES

Direct instruction about citing the above example correctly may prove to be too cumbersome or even ineffective; an average teacher in a given discipline likely does not have several class periods to spare or her students do not have several extra hours of homework time to dedicate to APA format when other course goals are more pressing, hence the need to turn to discovery learning.

The theories outlined in the previous section prompt teachers to select something about APA format that they want students to "discover": factual, conceptual or procedural knowledge, or some combination of the three. If the goal is to make sources easy to find for teachers, students at least need to know what kinds of genres they are citing (conceptual knowledge) and how to classify them (procedural knowledge). After that, students may have the ability to look a source up by genre in the latest version of the APA Style Guide, a tutorial from the university library, or a typical English composition textbook, and then follow the model they find. If they cannot find an exact match in a given style guide, they should learn to follow the APA's recommendations and find a comparable example to use as a

model. For teaching these kinds of procedures, we recommend the use of "microthemes" (Bean, 2001, pp. 79-80) because they consist of short scenarios that can include scaffolding in many forms—in background information, in questions, and so on—to promote discovery learning. At the end of this essay, we have included sample microthemes that we created and have used in our classrooms.

CONCLUSION

We have consulted theories of discovery learning in an attempt to render visible the types of knowledge that students need to use APA format successfully. Additionally, we have emphasized the use of scaffolding to elucidate the teacher's role in designing student-centered activities for learning APA format. To close, there are further considerations to make regarding the use of varied microthemes in the classroom, as well as the need for further empirical research.

Because APA format requires complex conceptual and procedural knowledge, we suggest that no single assignment could simply "cover" APA style. The choices a student has to make vary widely depending on the types of sources they find. Additionally, it would be difficult for students to retain what knowledge they gain from one class exercise or one take-home assignment. Willingham (2009) argues that students will only remember what they think about and reflect on, so it unlikely that one class exercise will be enough. Thus, teaching APA format will most likely mean teaching it periodically from a variety of angles, so as to engage students and get them thinking about it periodically, thus providing them with opportunities to rely on previous experiences as they enhance their skills. We recommend using a variety of microthemes like the ones we have provided with this paper periodically in a course. While these microthemes have been developed for use in our traditional ground classes, they could easily be adapted to blended or online learning situations by having students collaborate in assigned online groups or in discussion forum posts.

Regarding further research, we suggest that there are rich opportunities to study the efficacy of discovery learning and scaffolding as we have applied them here. We do not aim to provide a comprehensive list of research questions here, but the following can provide a general framework for future study:

1. How well do discovery-based, scaffolded microthemes work in the traditional classroom modality? In the online, hybrid, or blended modalities?
2. Aside from microthemes, what are other methods through which an instructor could apply discovery-based learning and scaffolding to teach APA format?
3. To what extent could other methods be developed to accommodate various learning modalities?

Answers to questions like these can come through further research based on a relationship between theories of learning and classroom practice.

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