Building a Better Term Paper:
Integrating Scaffolded Writing and Peer Review

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Abstract: This paper presents a method for teaching undergraduate students how to write better term papers in philosophy. The method integrates two key assignment components: scaffolding and peer review. We explain these components and how they can be effectively combined within a single term paper assignment. We then present the results of our multi-year research study on the integrated method. Professor observations, quantitative measures, and qualitative feedback indicate that student writing improves when philosophy term paper assignments are designed to generate multiple rounds of drafting and review.

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Undergraduates today write more than ever before, though seldom at length.[i] They contribute to discussion boards, write short papers, and answer exam questions. Above all, they compose enormous quantities of text messages, emails, and social media postings. Such writing enables the development of some important abilities, but it does not teach students the crucial critical thinking skills associated with researching and developing an extended philosophical argument.

We have developed a method for teaching students how to write better term papers. To ensure broad applicability, the first author, a philosopher, worked with two sociologists (second and third authors). The resulting method is well suited for lower as well as upper division courses, large as well as small courses. It is comprised of two integrated components. First, the term paper assignment is scaffolded, meaning that students draft and revise their papers in progressive stages, focusing upon different writing skills at each stage. Second, students work together throughout the term in peer writing groups that include students of diverse abilities. Within these groups, students practice specific skills and receive feedback from their peers while writing their papers.

This integrated method combines the pedagogical virtues of scaffolding and peer review. And it leads to improved student writing, as indicated by our multi-year study. Our findings are two-fold: First, student writing performance improved across the board, but especially amongst students who initially had low writing grades. Second, students, especially those in their junior and senior years, perceived significant improvements in their writing abilities over the course of the term. Taken together, these findings suggest that the method of combining scaffolded term paper assignments with peer review is effective in helping students become better writers.

Scaffolding

Researchers have shown that the development of expertise requires not just repetition, but also that the practice of skills be deliberately structured so as to facilitate learning.[ii] In the case of writing, this means that instructors must do more than just assign and grade papers if we wish to help students become better writers. We must also provide training and targeted practice in each of the distinct skills necessary for composing a strong paper. And we must help students learn to synthesize and integrate those skills.

Scaffolded writing assignments are designed to provide support to students in the acquisition of writing skills.[iii] Students often mistakenly view their writing abilities as fixed, and they regard writing assignments as tests of those abilities rather than as opportunities to

develop writing competencies.[iv] Scaffolded assignments deliberately emphasize the development of writing skills in addition to the end product. Breaking writing assignments into discrete tasks, each of which requires flexing different writing and cognitive "muscles," helps students learn *how* to write a philosophy paper, instead of simply requiring that they do so. Scaffolded assignments provide a structure or framework that enables students to build upon their existing abilities and develop new competencies. The ultimate goal is that students develop their writing abilities to the point that they can exercise them autonomously.[v]

Scaffolded writing assignments can take a variety of forms.[vi] What is essential is that scaffolding allows instructors to structure the assignments as a deliberate practice of writing skills within a progressive sequence. The assignments break more complex writing tasks down into manageable pieces so that students can practice the skills specific to each task. Each task builds upon those that came before, so that students develop increasingly advanced competencies. Students receive focused guidance throughout, as well as regular feedback upon their work.

In our courses, we assign term papers that are written and revised in progressive stages, with each stage focusing upon distinct and increasingly sophisticated writing tasks. By way of illustration, we offer two examples of scaffolded term paper assignments from the philosophy courses. In an advanced undergraduate seminar in value

theory, students write a 15-18 page paper on any topic of their choice relevant to the course. Students receive detailed feedback at each stage of the drafting process, rather than just at the end of the assignment. And although students are expected to complete every stage of the process, only the final version of the paper is graded. The stages of the advanced philosophy paper, each spaced a week apart, are as follows:

1. Propose a topic area and create an annotated bibliography. Meet with the professor to narrow the paper's focus.
2. Explain and analyze a specific philosophical debate concerning the chosen topic (5-6 pages). Receive comments.
3. Evaluate positions within the debate and develop an original philosophical argument in response (5-6 pages). Receive comments.
4. Extend the argument in the previous section by responding to potential objections, developing examples, and/or assessing implications (5-6 pages). Receive comments.
5. Revise the sections and integrate them into one cohesive paper, turned in for a grade.

While the sequence of writing tasks is highly structured by this assignment, students also retain a great deal of control over the content of the paper. Students choose topics that they find interesting, and they develop their own ideas and arguments. As a result, they display relatively high motivation throughout the writing process and often express pride and a sense of accomplishment when turning in the final versions of their papers.

In an introductory ethics class, students are given more direction and the writing tasks are somewhat less advanced. Students compose an 8-10 page paper, in the following stages, each spaced a week apart:

1. Choose a case study from a suggested list. (The list includes cases in environmental ethics and business ethics. Students may also propose alternative cases.)
2. Research the chosen case study, using the research to identify and explain a central ethical question raised by the case study (2-3 pages). Receive comments.
3. Explain an assigned pair of philosophical arguments and apply them to analyze the case study. (2-3 pages). Receive comments.
4. Develop an original philosophical response to the analysis in the previous section (2-3 pages). Receive comments.
5. Revise the sections and integrate them into one cohesive paper, turned in for a grade.

As in the more advanced course, students in the introductory course retain a great deal of control over the content of the paper, allowing students to pursue the topics in which they are interested. But the assigned tasks are somewhat more basic and thus more appropriate to students who have likely never before written a philosophy paper. And while much of the grade for this assignment is determined by the final version of the paper, students also receive some points for participating in each stage of the process. This provides an important incentive for introductory students (many of whom are required to take the course) that is less necessary in advanced courses.

In comparison to traditional term paper assignments, scaffolded assignments have two important virtues. First, students are better able to avoid "cognitive overload" when the writing process is broken into a progressive sequence of discrete tasks. Research shows that when students are asked to perform several tasks all at once, as is the case in traditional term paper assignments, their performance degrades. [vii] And this is especially true when one is relatively

inexperienced with those tasks. Many students have little experience analyzing the philosophical arguments of others, much less constructing their own arguments.[viii] And even advanced philosophy majors often find the prospect of writing a lengthy term paper quite daunting. Scaffolding temporarily restricts the scope of the writing tasks so that students can focus on one set of tasks at a time. At each stage of the writing process, we give students detailed instructions, both verbally and in writing, about how to approach the section at hand. These instructions explain the distinct tasks in a progressive sequence so that students write their papers one step at a time, rather than by trying to tackle a myriad of complex writing tasks all at once.

To complement each of the stages of the scaffolded term paper, we assign in-class writing exercises that give students additional opportunities to practice the relevant skills. In philosophy, some of these exercises involve interpreting and explaining a passage from a text. Others require applying a philosophical claim to an example. Some exercises involve assessing and evaluating philosophical claims, and others ask students to develop their own questions, ideas, and arguments. Students complete these writing exercises in-class, sometimes individually and sometimes in small groups. They receive immediate feedback in the form of group and class discussions of the exercise.[ix] When assigned on a regular basis in coordination with the scaffolded term paper, these low-stakes writing exercises allow

students to repeatedly practice philosophical writing throughout the term.

A second pedagogical virtue of scaffolded term papers is that they create an opportunity for students to receive "formative assessments" during the writing process itself.[x] In many courses, students only receive feedback upon term papers in the form of summative assessments at the end of the term. Many students have little experience with revision because it is thus not integrated into their writing assignments. And even when given opportunities to improve their work for a higher grade, students often make only minor edits, perhaps changing some words and correcting grammar mistakes. This is perhaps because most students, research shows, understand "revision" to simply mean "rewording" or "cleaning up." [xi] They are largely unfamiliar with the process of more substantially improving their work over time.

Scaffolded term papers are designed to give students multiple rounds of feedback while they are writing their papers, rather than just at the end. They thus receive feedback when they can make the best use of it.[xii] Because students are ultimately graded primarily (or only) on the finished product that they turn in, it is to their advantage to improve their earlier sections while composing later sections. This encourages them to begin rethinking their writing at a much earlier point, before they have even completed a full draft of the paper. And even if students only draft each section the night before it is due, they

nonetheless end up working on the paper for a longer period of time instead of binge writing the entire paper in one evening. This enables them to deepen and extend their thinking as they use feedback to develop their work over an extended timeframe.

Despite the pedagogical value of scaffolded term papers, such assignments can demand a lot from the instructor. Providing extensive and helpful feedback to every student on each stage of a lengthy term paper requires a great deal of time, even if one uses a rubric or other standardized system of comments. Grading in-class writing exercises requires additional time, even when the grading scheme is very basic. Such intensive and individualized attention might be possible in a small course, but not in larger courses or even in multiple small courses at the same time. The challenge, then, is to implement scaffolded term paper assignments in such a way that they place fewer demands on a professor's time while still teaching students how to write strong philosophy papers.

Peer Writing Groups

Our solution combines scaffolded assignments with peer writing groups. The writing group concept most essentially involves students providing and receiving constructive feedback to a small subset of classmates. Early in the semester, students are assigned to writing groups that endure for the term (4 students per group). Groups could be randomly assigned, but ours are assigned on the basis of writing

ability. In order to determine writing ability and balance ability levels across the groups, we use scores on an initial writing assignment. This short assignment varies in length between one paragraph and a few pages, depending on the course and the professor.

We initially developed the writing group concept in response to concerns about the time pressures associated with commenting on paper drafts, especially in large courses. A minimal implementation of the peer writing group model would consist just in peer review of paper drafts, which would have the advantage of allowing peer reviews to be carried out anonymously. Such anonymity may result in better feedback if it allows students to feel more comfortable criticizing one another's work.[xiii] However, we have observed that face-to-face paper exchanges are also quite valuable, as students tend to give more in-depth feedback when discussing their reviews in person. In addition, our more robust implementation of the peer group model serves to organize other writing activities that complement the stages of the term paper. In our courses, these activities include: in-class writing exercises, training in how to compose key parts of a philosophy paper (e.g. drafting thesis statements), exercises in rubric application and/or creation, and group assessment of anonymous writing samples.

Nonetheless, the primary function of the writing groups is to provide peer feedback upon paper drafts. At each drafting stage of the scaffolded assignment, students submit their writing to other

students instead of the professor. Each student in turn receives three drafts upon which to comment. Students are not asked to assign grades to one another, but rather to offer constructive criticism on how to improve the writing. This feedback takes the form of filling out an instructor-provided rubric and responding to detailed questions about the writing's strengths and weaknesses. The peer reviews may occur in person, where students exchange hard copies of their writing, or using online tools.[xiv] We have tried several variations of the peer review process in conjunction with scaffolded term paper assignments. However the peer review is structured, it should involve students both giving and receiving feedback as they draft their papers in stages.

The pedagogical virtues of peer review have by now been firmly established in the literature. Peer review benefits students in multiple ways. First, and most obviously, it allows students to receive swifter feedback in greater volume. That feedback is generally of lower quality than students would receive from the professor, but students do nonetheless receive valuable feedback from one another. [xv] Researchers have shown that peer feedback is generally reliable and valid. [xvi] Most commonly, it serves to alert students to gaps and deficiencies in their writing.[xvii] Assigning a greater number of reviews thus helps to address the issue of quality because problems in a paper are more likely to be detected if it is reviewed by multiple students rather than just one.[xviii]

Indeed, research reveals that students often find comments from their peers *more* helpful than comments from instructors. [xix] This seems to be because students better understand one another's feedback; the instructor's comments refer to knowledge that students do not yet possess. Although students are not as skilled as professors at assessing writing, they are often more effective at explaining their assessments to one another because of similarities in perspective and skill level. Moreover, instructor feedback is sometimes vague and unclear because of time pressures. Such feedback might seem perfectly comprehensible and adequate when given to other instructors, but it is nonetheless opaque to many students.

A second pedagogical virtue of peer review is that *giving* peer feedback helps students to develop a new critical perspective on their writing, namely that of the reader. As students evaluate the writing of others, they observe writing strengths and diagnose weaknesses. This helps them to move from what Mark Richardson describes as "writing to learn" to the more advanced skills of "writing to teach." [xx] When students first draft their papers, they are attempting to think through arguments and explain ideas, primarily to themselves. But when students step into the shoes of a reader and evaluate writing by how well it informs or persuades the reader, they take up a new perspective. They become aware of the potential for their writing to communicate with others. Research confirms that students thus can

develop important new critical thinking skills when they review one another's drafts.[xxi]

In order for peer review to be pedagogically effective, students must receive training and guidance in the process.[xxii] In our courses, the training begins with a brief class discussion of students' prior experiences with peer review. Most students agree that peer review can be useful, but they also express a wish for more critical feedback from peers. This discussion helps the instructor to emphasize the value of constructive *criticism*. Students are also briefly told about how the instructor's own writing has benefitted from giving and receiving critical peer feedback, and about the importance of peer review to academic writing more broadly.[xxiii]

Following this initial discussion, students are given short samples of writing to review for practice, in groups.[xxiv] These anonymous samples are chosen to reflect the distinct sets of skills associated with each stage of the scaffolded term paper. Just before each round of peer review, students practice reviewing similar samples in order to familiarize themselves with a variety of writing strengths and weaknesses. Each exercise is followed by a brief class discussion of their reviews. These activities are intended not only to give students practice with the relevant skill sets, but also to help foster a supportive environment in which students are more comfortable giving and receiving critical feedback.[xxv]

Research indicates that students benefit from giving peer review when it causes them to engage in critical thinking about the criteria for successfully completion of the specific writing task(s) at hand.[xxvi] To this end, we structure the peer reviews around questions that are specific to the writing skills employed at each stage of the scaffolded paper. Each session of peer review in philosophy is guided by both the paper rubric and a response sheet specifically designed for that stage of the paper. The response sheet prompts students to identify relevant strengths and weaknesses of the writing, as well to make suggestions for revision.[xxvii] The rubric gives students repeated practice with applying the same criteria by which their own papers will eventually be graded. The goal is thus not only that students receive useful feedback, but also that the activity of reviewing the work of others increasingly comes to inform their understanding of the assignment and their assessments of their own writing.

Like many instructors, we remain leery of allowing students to determine one another's grades. In our courses, students review one another's drafts, but they do not assign grades. Some students are nonetheless wary of the feedback they receive from their peers. We have found that it is helpful for the instructor to maintain an open door policy with regard to reading paper drafts. At any point during the drafting and revision process, students are told, they may stop by during office hours to receive feedback. The instructor is available during these times to read and comment upon drafts, but only in

person. Some students do not take advantage of this offer, but others do. One motivated philosophy student visited office hours on 5 separate occasions, each time having revised her paper in response to previous feedback! As a result of her hard work, her paper improved dramatically. An open door policy on drafts allows such motivated students to receive more expert feedback, but without being excessively time-consuming for instructors.

Findings: How the Integrated Method Helps Students

Our assessment includes instructor observations as well as data from four courses in philosophy and two in sociology, collected over a two-year period. In all, we obtained complete data from 115 philosophy students and 53 sociology students. The differences in pedagogical approach for the assignment across courses were slight, and the research design itself was almost identical across courses and professors. The main difference was the specific focus of the term paper assignment within the courses.

Throughout the study, the three professors involved kept detailed notes and met regularly to discuss experiences, challenges, and insights. All professors noticed a marked improvement in the quality of the term papers. Students seemed to have a better grasp of the assignment, and fewer papers included basic mistakes such as: lacking a thesis statement, failure to follow instructions, lack of organization, and similar deficiencies. We also noticed that student motivation and

"buy-in" was relatively high throughout the writing process. [xxviii] Perhaps as a result, papers seemed to have greater depth and be somewhat more thoughtful, and relatively few papers seemed to receive low grades.

In addition to these observations, we gathered both quantitative and qualitative data after receiving Institutional Review Board (IRB) approval from our institution. We used data from graded assignments to assess improvement in student performance over the course of the term, as well as questionnaire data to evaluate how students perceived their own writing abilities. To evaluate improvement in student performance from beginning to end of the semester, we compared philosophy student grades on a short paper from early in the semester with grades on the term paper. [xxix] Although the paper from the early part of the semester was a shorter assignment, it had a similar structure and was evaluated using the same rubric as the final paper.

Consistent with our observations, there was a dramatic improvement in the performance of students who initially had lower writing grades. Across the philosophy courses, student grades were on average 2.78% higher on the final paper than on the first paper ($p < .001$). But those who received below 80% on the first paper improved on average by 7.5%, and those who initially scored between 80% and 90% improved by 3.03% ($p < .001$). These

findings indicate that the performance gains were especially concentrated amongst students who needed the most help.[xxx]

In order to understand how these improvements in writing performance might be connected with gains in students' underlying writing abilities, we also looked to student perceptions of the writing process and of their own abilities. Such perceptions give us a window into the "metacognition" of students upon their own learning.[xxxi] Researchers have shown that reflection upon one's own learning is an essential part of developing new competencies.[xxxii] Novices typically engage in very little of this type of reflection and thus fail to actively direct their own learning. They also have difficulty accurately assessing their own strengths and weaknesses relative to a task because they do not have a strong grasp of that task. Relative experts, in contrast, engage in self-extensive monitoring and strategizing about learning approaches, adjusting their approaches in response to new challenges. They are also more accurate when assessing their own strengths and weaknesses, precisely because they have a better grasp of the tasks at hand.

In order to learn more about how students perceived their own learning, we administered a questionnaire at the beginning of the semester and again at the end. We asked about students' perceptions of their abilities in six distinct areas: communicating ideas in writing, recognizing the components of a well-written paper, recognizing the components of a logical argument, using feedback to improve

performance, completing course assignments on time, and providing quality feedback to others.[xxxiii] In each area, students rated themselves on a scale ranging from 1 to 5 as: low, okay, good, very good, or excellent. Students also identified their gender, class standing, and how long they had been attending college. In addition, we solicited open-ended feedback by asking students to provide comments if they would like. Although only 14 percent of students provided open-ended responses on the initial questionnaires, nearly half (49 percent) provided qualitative responses on the follow-up questionnaire.
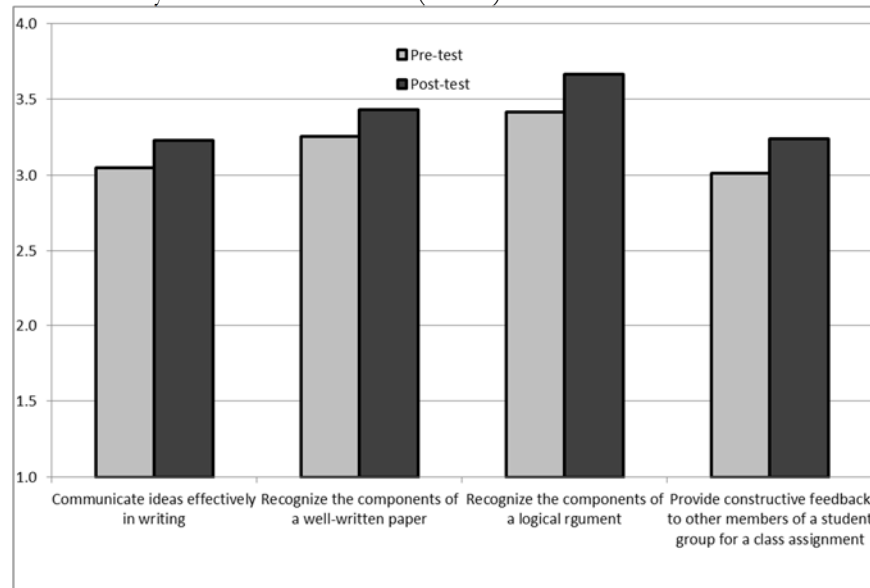
The data reveal that students' perceptions of their abilities increased significantly in four areas: communicating ideas effectively in writing, recognizing the components of a well-written paper, recognizing the components of a logical argument, and providing constructive feedback to other members of a student group for a class assignment.[xxxiv] Figure 1 shows data from 162 students in both philosophy and sociology courses. The gains in the post-test scores on each of these measures are statistically significant ($p < .05$) using paired sample t-tests.

Figure 1. Pre and Post-test Measuring Student Perceptions of their Ability on Four Skill Measures (N=162).
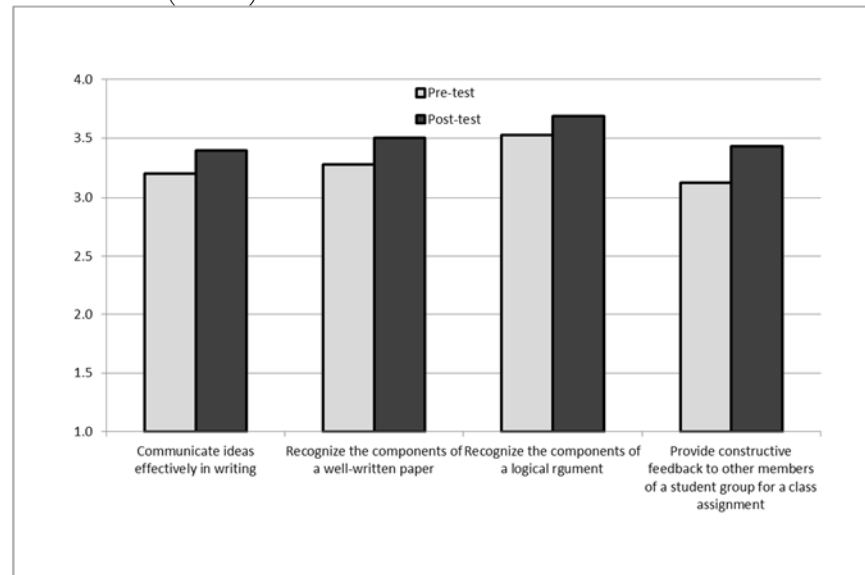
We further examined the data to determine whether there were differences by discipline, gender, class standing, and whether the peer review was conducted online or in class. We found no differences between women and men, and only slight differences by delivery method (i.e. whether the peer review was conducted online or in-person). We did discover differences between philosophy and sociology, but these differences tracked class standing (the philosophy courses contained more freshman and sophomore students). In particular, juniors and seniors reported the greatest gains. Figure 2 illustrates the perceived gains among 62 junior and senior philosophy students, in order to highlight the effects within philosophy. (We note that these trends were similar across the full sample of juniors and seniors.)

Figure 2. Pre and Post-test Measuring Philosophy Juniors and Seniors' Perceptions of their Ability on Four Skill Measures (n = 62).

Higher perceptions of skill level at the end of the semester among junior and senior philosophy students were statistically significant at p < .05 level (using a paired-sample t-test) for three of the four measures: recognizing the components of a well-written paper, recognizing the components of a logical argument, and providing constructive feedback to other members of a student group for a class assignment. The difference in students' perceptions of their ability to communicating ideas effectively in writing, although not statistically significant, does suggest perceived improvement.

Upperclassmen thus perceived that they developed greater competency over the course of the term. However, we also found that freshmen and sophomores, unlike the more advanced students, scored themselves either the same or lower on several indicators of skill at the end of the term. What could explain this finding? One

possibility is that the writing abilities of underclassmen did not, in fact, improve. But open-ended student responses from freshmen and sophomores suggest otherwise. Their comments indicate that they found the assignment and writing process challenging but worthwhile. One student remarked, for instance: "I really liked how the paper was broken up into 3 parts. Being a freshman, I haven't written many papers, especially 8 pages. It was especially nice to have the peer review along the way because I don't always see what I do wrong."

We hypothesize that the discrepancy reflects a relative lack of experience with college-level writing amongst freshmen and sophomores. This hypothesis is consistent with extensive research showing that novice students are less accurate when assessing their own strengths and weaknesses.[xxxv] More specifically, novices tend to overestimate their abilities and be unjustifiably confident when approaching tasks. The underclassmen in our study, lacking in college-level writing experience, may thus have had inflated senses of their writing ability at the start of the term. Exposure to the writing of others and to new writing tasks and criteria in effect "corrected" their self-assessment, as they realized that their initial assessment was inflated. Juniors and seniors, conversely, may have already had more experience with being graded at the college level and seeing the writing of other students, giving them a more realistic sense of their own abilities.

If our hypothesis is correct, then the discrepancy between self-perceptions of more and less experienced students reflects the achievement of different learning outcomes. Most classrooms today include a wide variety of student backgrounds and experience levels. Scaffolded assignments are intended to engage students at their current skill levels, providing support so that students can build upon their existing competencies. Relatively novice students need more help understanding the writing tasks and assessing their own abilities relative to the evaluation criteria. More experienced writers are, in contrast, refining their skills and strategies, and they can more accurately assess their abilities and their work.

Indeed, open-ended feedback from students at the end of the term indicates that different students perceived different benefits from the assignment and writing process. Student responses were generally positive, across the board. Negative comments tended to center on formal aspects of the assignment, such as the length of the paper. Some students expressed a wish for more critical feedback from peers. However, student responses to both peer review and scaffolding were generally enthusiastic.

Some students reported that they benefitted primarily from the scaffolded structure of the assignment. Several noted that it made the writing tasks more manageable. For instance, one student remarked: "I like how you broke it up over the semester. It made it a lot easier than just telling us its due Dec 4th. It made me not procrastinate and

made it simpler." Other students mentioned that scaffolding the assignment had helped them become more reflective about their writing. One student noted, for example: "By breaking this final paper into parts, one thing I thought was the most helpful was it made the paper less overwhelming. It also helped me see it develop so I could add or change it over time. This made it so I didn't have to be set in stone with my ideas. I could evolve it into a final product. I also think that with the help of my peers I could refine my paper."

Other student comments focused more upon the peer review process.[xxxvi] Several students, and especially those with low scores on the first paper, noted that receiving peer feedback helped them to identify problems in their own work. One student remarked, for instance: "I think that the peer writing group was a great idea because it really helped me notice the mistakes that I made and gave me some great feedback to how I can make some good and smart changes to my assignment." Other students, however, reported that they benefitted more from *giving* feedback, and that they found exposure to the writing of others to be of great value. One student commented, for instance: "I liked how I was able to read others papers. I felt like this gave me some more insight and ideas that I could incorporate to make my argument stronger. On the other side I also saw the wrong ways to argue for my topic and learned from those."

Conclusion

Taken together, instructor observations, grade data, and student feedback suggest that the integrated method helped students in multiple ways. Students benefitted in different ways from the assignment and writing process, depending upon their background experience and skill levels. We found that, while student writing achievement improved across the board, students with low initial writing scores improved most dramatically. This finding is consistent with instructor observations that papers revealed a better grasp of the assignment and included fewer basic mistakes. We also found that while juniors and seniors reported significant increases in their writing skills over the course of the semester, similar gains were not reported by freshmen and sophomores. We hypothesize that this discrepancy reflects a relative lack of college-level writing experience amongst freshman and sophomores. This hypothesis is consistent with research on the role of self-assessment within metacognition, as well as with open-ended student reflections at the end of the semester.

We designed the writing group concept in the hopes of maintaining rigorous term paper assignments, even in large courses. We found that the combination of peer review with scaffolding is effective in helping students to learn how to write better term papers, with less of a time commitment on the part of the professor than

scaffolded assignments without peer review. Our study evaluated improvements in student work over one semester. Future research could more directly assess how the assignment compares to other approaches. Comparisons with control groups using traditional term paper assignments, those that include scaffolded term papers without peer review, and those that use peer reviewed term papers without scaffolding would further our understanding of the pedagogical effectiveness of combining scaffolding with peer review and help assess the potential unique pedagogical contributions of the assignment.[xxxvii]

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[i] See Arum, Richard and Josipa Roksa, *Academically Adrift: Limited Learning on College Campuses* (University of Chicago Press, 2010).

[ii] See Ericcson, K. Anders, Ralf Th. Krampe, and Clemens Tesch-Romer, "The Role of Deliberate Practice in the Acquisition of Expert Performance," *Psychological Review* 100:3 (1993), 363-406; Kellogg, Ronald and Bascom Raulerson III, "Improving the Writing Skills of College Students," *Psychonomic Bulletin and Review* 14:2 (2007), 237-242; and Johnstone, Karla, Hollis Ashbaugh, and Terry Warfield, "Effects of Repeated Practice and Contextual-Writing Experiences on College Students' Writing Skills," *Journal of Educational Psychology* 94:2 (2002), 305-315.

[iii] The scaffolding metaphor is rooted in Vygotsky's theory of the zone of proximal development, i.e. the zone that exists between a student's current skill level and the level at which he or she can perform with guidance from instructors or advanced peers. Scaffolding is intended to enable students to achieve outcomes that would be beyond their unassisted efforts. See Vygotsky, Lev, *Mind in society: The development of higher psychological processes* (Cambridge, MA: Harvard University Press, 1978), 84ff.

iv See Ericcson, K. Anders, Ralf Th. Krampe, and Clemens Tesch-Romer, "The Role of Deliberate Practice in the Acquisition of Expert Performance," *Psychological Review* 100:3 (1993), 363-406, and Pajares, Frank and Margaret J. Johnson, "Confidence and Competence in Writing: The Role of Self-Efficacy, Outcome Expectancy, and Apprehension," *Research in the Teaching of English* 28:3 (1994), 313-331.

v See Beed, Penny, Marie Hawkins, and Cathy Roller, "Moving Learners Toward Independence: The power of Scaffolded Instruction," *Reading Teacher* 44:9 (1991), 648-655, and Roehler, Laura and Danise Cantlon, "Scaffolding: a Powerful Tool in Social Constructivist Classrooms," in Hogan, Kathleen and Michael Pressley (eds.), *Scaffolding Student Learning: Instructional Approaches and Issues* (Cambridge, MA: Brookline Books, 1997), 6-42.

vi For example, see Coe, Cynthia, "Scaffolded Writing as a Tool for Critical Thinking: Teaching Beginning Students How to Write Arguments," *Teaching Philosophy* 34:1 (2011), 33-50. See also Dietz, Bernadette E. and Lynn Harper Ritchey (eds.) 2008. *Scaffolding for Student Success in Learning: Effective Practices in Using Instructional Strategies* (Washington, DC: American Sociological Association).

vii See Ambrose, Susan, Michael Bridges, Michele DiPietro, Marsha Lovett, Marie Norman, *How Learning Works*, (San Francisco: Jossey Bass, 2010), 103-107, and Wickens, C.D., "Processing Resources and Attention," in D.L. Damos (ed.), *Multiple Task Performance* (London: Taylor and Francis, 1991)), 3-34.

viii See "The Negelcted R: The Need for a Writing Revolution," The National Commission on Writing in American Schools and Colleges (2003).

ix The writing exercises are also graded with a check or check-plus, though comments are limited because of time pressures.

x See Black, Paul and Dylan Wiliam, "Assessment and Classroom Learning," *Assessment in Education* 5:1 (1998), 7-74, and Popham, James, *Transformative*

Assessment (Alexandria, VA: Association for Supervision and Curriculum Development, 2008).

xi See Sommers, Nancy, "Revision Strategies of Student Writers and Experienced Adult Writers," *College Composition and Communication* 31:4 (December 1980), 378-388.

xii See Hattie, John and Helen Timperley, "The Power of Feedback," *Review of Educational Research* 77 (2007), 81-112, and Smyth, Karen, "The Benefits of Students Learning About Critical Evaluation Rather than Being Summatively Judged," *Assessment & Evaluation in Higher Education* 29:3 (2004), 370-378.

xiii See Ruiling, Lu and Linda Bol, "A Comparison of Anonymous Versus Identifiable e-Peer Review on College Student Writing Performance and the Extent of Critical Feedback," *Journal of Interactive Online Learning* 6:2 (2007), 100-115.

xiv In our courses, we have used Canvas, a free online course management service that is widely available, as well as Thinkspace, a platform still in development and restricted to instructors at our own university. Both have worked well, though neither is perfect.

xv Falchikov, Nancy and Judy Godfinch, "Student Peer Assessment in Higher Education: A Meta-Analysis Comparing Peer and Teacher Marks," *Review of Educational Research* 70:3 (2000), 287-322.

xvi Reliable in the sense of consistent, and valid in the sense of matching assessments by the professor. See Cho, Kwangsu, Christian Schunn, and Roy Wilson, "Validity and Reliability of Scaffolded Peer Assessment of Writing From Instructor and Student Perspectives," *Journal of Educational Psychology* 98:4 (2006), 891-901.

xvii Nicol, David, Avril Thomson, and Caroline Breslin, "Rethinking Feedback Practices in Higher Education: A Peer Review Perspective," *Assessment and Evaluation in Higher Education* 39:1 (2014), 102-122.

[xviii] Cho, Kwangsu and Charles MacArthur, "Student Revision with Peer and Expert Reviewing," *Learning and Instruction* 20:4 (2010), 328-338.

[xix] This has been called "the curse of expertise." See Cho, Kwangsu and Charles MacArthur, "Student Revision with Peer and Expert Reviewing," *Learning and Instruction* 20:4 (2010), 328-338.

[xx] Richardson, Mark, "Student Papers and Professional Papers: Writing to Learn and Writing to Teach in Undergraduate Philosophy Courses," *Teaching Philosophy* 25:4 (2002), 291-309.

[xxi] See Anderson, Tony, Christine How, Rebecca Soden, John Halliday and Jennifer Low, "Peer Interaction and Learning of Critical Thinking Skills in Further Education Students," *Instructional Science* 29 (2001), 1-32; Lundstrom, Kristi and Wendy Baker, "To Give is Better than to Receive: The Benefits of Peer Review to the Reviewer's Own Writing," *Journal of Second Language Writing* 18:1 (2009), 30-43; MacArthur, Charles, "Best Practice in Teaching Evaluation and Revision," in S. Graham, C. MacArthur, J. Fitzgerald, eds., *Best Practice in Writing Instruction* (Guilford: New York, 2007), 141-62; and Topping, Keith, "Peer Assessment Between Students in Colleges and Universities," *Review of Educational Research* 68:3 (Autumn, 1998), 249-276.

[xxii] See Beach, Richard and Tom Friedrich, "Response to Writing," in 2008 *Handbook of Writing Research* MacArthur, Graham, and Fitzgerald (eds), (New York: Guilford), 222-234; Falchikov, Nancy, 2005. *Improving Assessment Through Student Involvment* (London: Routledge); Fallows, Stephen and Balasubramanyam Chandramohan "Multiple Approaches to Assessment: Reflections on Use of Tutor, Peer Review, and Self-Assessment," *Teaching in Higher Education* 6:2 (2001), 229-46.

[xxiii] See Hansen, Jette G. and Jon Liu, "Guiding Principles for Effective Peer Response," *ELT Journal* 59:1 (2005), 31-38.

[xxiv] See Nicol, David and Debra Macfarlane-Dick, "Formative Assessment and Self-Regulated Learning: A Model and Seven Principles of Good Feedback Practice,"

Studies in Higher Education 31:2 (2006), 199-218, and Min, Hui-Tzu, "Training

Students to Become Successful Peer Reviewers," *System* 33:2 (2005), 293-308.

xxv See Hansen, Jette and Jon Liu, "Guiding Principles for Effective Peer

Response," *ELT Journal* 59:1 (2005), 31-38.

xxvi See also Nicol, David, Avril Thomson, and Caroline Breslin, "Rethinking

Feedback Practices in Higher Education: A Peer Review Perspective," *Assessment

and Evaluation in Higher Education* 39:1 (2014), 102-122.

xxvii See Nilson, Linda, "Improving Student Peer Feedback," *College Teaching* 51:1

(March 2010), 34-38.

xxviii Motivation is an essential component of deliberate practice. See especially

Ericcson, K. Anders, Ralf Th. Krampe, and Clemens Tesch-Romer, "The Role of

Deliberate Practice in the Acquisition of Expert Performance," *Psychological Review*

100:3 (1993).

xxix The initial sociology papers were more dissimilar from the sociology term

papers (in length and assessment). However, the sociology grades did show a

similar pattern of improvement, with students who initially scored lowest

improving the most on their term paper grades.

xxx This finding is consistent with previous research showing that low-achieving

students may benefit the most from peer review. See Mulder, Raoul, Chi Baik, Ryan

Naylor and Jon Pearce, "How Does Student Peer Review Influence Perceptions,

Engagement and Academic Outcomes? A Case Study," *Assessment & Evaluation in

Higher Education* 39:6 (2014), 657-677.

xxxi See Ambrose, Susan Michael Bridges, Michele DiPietro, Marsha Lovett, and

Marie Norman, *How Learning Works* (San Francisco: Jossey Bass, 2010), 190ff.

xxxii See especially Negretti, Raffaella, "Metacognition in Student Academic Writing:

A Longitudinal Study of Metacognitive Awareness and Its Relation to Task

Perception, Self-Regualtion, and Evaluation of Performance," *Written Communication*

29:2 (2012), 142-179, and Zimmerman, Barry and Albert Bandura, "Impact of Self-

Regulatory Influences on Writing Course Attainment," *American Educational Research Journal* 31:4 (1994), 845-862

xxxiii See Min, Hui-Tzu, "Training Students to Become Successful Peer Reviewers," *System* 33:2 (2005), 293-308.

xxxiv The remaining two categories, the ability to use external feedback to improve personal performance on course assignments and the ability to complete course assignments on time, showed no statistically significant differences from the beginning to the end of the semester. This finding suggests that students might benefit from more emphasis on revision throughout the semester. For example, writing exercises could focus not just upon evaluating anonymous writing samples, but also upon suggesting improvements and revisions.

xxxv See Dunning, David *Self-Insight: Roadblocks and Detours on the Path to Knowing Thyself* (Taylor & Francis 2005), and Ehrlinger, Joyce, Kerri Johnson, Matthew Banner, David Dunning, and Justin Kruger, "Why the Unskilled Are Unaware: Further Explorations of (Absent) Self-Insight Among the Incompetent," *Organizational Behavior and Human Decision Processes* 105:1 (2008), 98-121.

xxxvi These comments are consistent with research on perceptions of peer review, showing that most students believe that peer review helps them to improve their writing. See Mulder, Raoul, Jon Pearce and Chi Baik, "Peer Review in Higher Education: Student Perceptions Before and After Participation," *Active Learning in Higher Education* 15:2 (2014), 157-171.