

REPLICATION OF A TUTOR-TRAINING METHOD FOR IMPROVING INTERACTION BETWEEN WRITING TUTORS AND STEM STUDENTS

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Abstract

The improvement of tutor training programs can impact the important work of writing centers. Tutors often feel less comfortable tutoring in genres different from their own discipline. A previous study introduced an assignment-specific tutor training model to improve writing center tutoring sessions between engineering students and writing tutors. The results of the previous study indicated a valuable addition to the resources available for engineering students. This model has now been replicated at two universities to assess the potential for wider dissemination. Preliminary data analysis suggests a relationship between initial tutor rating of student work, student perceptions of tutoring, and tutor perception of student engagement in the tutorial. Plans for future research include continued replication and expansion to test larger sample sizes, analysis of impact within and adaptations for other STEM areas, and continued study of the impact on tutoring team projects.

Introduction

The improvement of tutor training programs can have an impact on the important work of writing centers. The issue of a tutor's ability to help students across disciplinary boundaries has come under scrutiny as writing center lore is evaluated to establish a pedagogical foundation for the writing center. Practitioners have voiced their concern that there is not a firmly established set of standard practices for writing tutors (Nordlof, 46), there is a lack of replicable, aggregable, and data-supported (RAD) research within the field of writing center studies (Perdue & Driscoll, 186-187), and that tutors may lack sufficient training to work with students from disciplines outside their own area of study (Devitt, 216-217; Dinitz & Harrington, 81; Kohn).

In 2014, Sue Dinitz and Susanmarie Harrington stated that "some of the problematic moves of the tutors lacking disciplinary expertise could perhaps be

mitigated through targeted tutor training" (95). Targeted tutor training can take many forms, however, and further study remains to discern exactly which practices will effectively improve tutor confidence as well as the quality of individual sessions, regardless of subject matter.

This study examined the early replication of a tutor training method designed to improve the ability of tutors to work comfortably with students outside their own area of expertise (Weissbach & Pflueger, 214-215). This study directly addresses the need for writing tutors to effectively tutor engineering students and to receive targeted training in order to be able to improve their genre transfer skills. The assignment-specific training can improve tutors' abilities to provide effective writing instruction to students from other disciplines. Additionally, it begins to examine research that is lacking in the writing center field, which, ideally, will contribute to the continued development of a system of practices within writing center pedagogy, as discussed in the following literature review.

Literature Review

Brief Background of Writing Centers

The concept of the writing center has been a standardized product of student collaboration since the 1970s (Kail, 595). Despite becoming more popular, the role of writing centers has not been formally established within all institutions of higher education, and they have often been forced to fight for space and resources and have sometimes even been eliminated (Boquet, 471-472). However, in the institutions where writing centers do exist, they are a valuable service for students.

The writing center occupies a unique space on a campus, both in its physical location as well as its utilization within the institution as an entity. Assisting students across disciplines is one of the writing center's trademarks and strengths, appealing to students (and sometimes faculty and staff) across the university who may be looking to improve their communication skills. The "physical or time constraints of the traditional classroom" (Turner, 45) are limitations that can be removed by student utilization of the writing center.

The crucial role that a writing center may play in the communication abilities of its tutees spans the campus in a metaphorical sense, but the location of the center itself may span the campus in a literal sense. "The writing laboratory of the early 20th century was conceived of not as a place at all," states Boquet, "but rather as a method of instruction" (466). Therefore, the pedagogical methods utilized within the physical space of the writing center are separate from any class a student may take. A writing center can provide a service that is not found within the classroom itself—the ability of students to work with peers, rather than their professors, in order to improve their writing. Writing centers have proven themselves to be an invaluable service, earning recognition through professional organizations and publications (Perdue & Driscoll, 186).

Writing Center Pedagogy

The pedagogical theory behind writing centers is rooted in inquiry. Classical Socratic questioning is at the core of the peer tutor's approach when helping a student. Platonic heuristics can also be utilized as an effective method of helping students develop their own process of looking at their writing with a critical eye (Raign, 32-33). These methods have been developed further in more recent years using the educational practices of scaffolding rather than routine correction (Nordlof, 56-59; Haider & Yasmin, 170). These pedagogical methods, among others, reinforce the idea that current best practices include using instructional methods such as scaffolding and nondirective assistance to guide tutees with their writing.

Historically, writing center tradition has suggested that any method of direct instruction be avoided within the tutoring session (Nordlof, 48). As writing center pedagogy evolves, however, it becomes more apparent that tutors can adjust the amount of directive tutoring that they provide each student. This combined approach of using both directive and non-directive approaches is especially useful in situations where the tutor is not familiar with the subject matter being discussed and may need to ask questions before

offering more direction. Utilizing both directive and non-directive approaches with scaffolding methods can assist writing center tutors in providing more effective instruction to students while also enabling them to teach themselves better writing practices.

Scaffolding

In a study of peer tutors' questioning behaviors, Inneke Berghmans, et al. states that "scaffolding implies effective questioning behavior" (705). Using a scaffolding method in the writing center involves asking the student high-level questions about their writing, in the style of Socratic questioning intended to help students come to their own conclusions and find their own answers. Peer tutors are often instructed in their training to use this approach, although there have been many studies that show a gap between theory and practice (Berghmans, et al., 704-705; Nordlof, 46). While peer tutors are often trained to avoid direct instruction and use questioning methods within sessions, sessions do not all follow this formula. Tutors regularly and effectively integrate their knowledge of genre and writing conventions between Socratic questioning (Carino, 98).

In addition, Isabelle Thompson's study of verbal and nonverbal tutoring strategies examines the communication methods an experienced tutor uses during the course of one tutoring session, recommending a combination of cognitive and motivational scaffolding (444-447). Cognitive scaffolding provides support to the student using questioning tactics, pushing the tutee to discover the solution. Motivational scaffolding utilizes verbal praise and affirmation to keep students focused and engaged with the tutoring session. This approach of questioning and praise is reminiscent of Kathryn Raign's recommendation for tutor instruction using Platonic heuristics (32-33). However, the amount of cognitive and motivational scaffolding that a tutor uses should be considered within the recommendations of directive vs. nondirective tutoring. Effective scaffolding requires more directive tutoring in initial sessions, decreasing as the student progresses (Nordlof). The scaffolding recommendations made by Berghmans, et al., Thompson, Raign, and John Nordlof inherently contain a recommendation for mixing directive and nondirective methods. Additional support for mixing directive and nondirective methods in the writing center can be found in Peter Carino's discussion of the power structure between the tutor and the tutee during a session (106-109). Carino states that, at times, tutors may use their authority as skilled writers to provide students with clear answers based on writing expertise but without knowledge of the subject matter (106).

This is potentially problematic when a student is writing within their area of expertise and the tutor does not have the subject knowledge to provide correct directive information to the tutee. However, asking questions early in the session can mitigate these issues. Providing the tutor with background information about the material that the student brings to the writing center can also help improve the session. Tutors can use Socratic questioning and include scaffolding techniques combined with directive tutoring to create an effective learning environment. By doing so, tutors can help the students discover their own knowledge of the subject matter and craft it in a way that will be understood. This use of scaffolding in combination with directive and non-directive methods and genre theory can aid in the transfer of learning between different contexts, which will be discussed next.

Transfer of Learning in Peer Tutoring

The principles of knowledge transfer originate within educational psychology. As learners note similarities between different areas of learning, knowledge that is already present is engaged in transfer, and prior knowledge may be available for new application (Devet, 121). Amy Devet identifies one aspect of learning transfer especially applicable in this study: declarative-to-procedural transfer, generally defined as the process of “providing a ‘schema’” (126), which allows the consultant to transfer a general concept of learning to the student. By utilizing this general schema, the tutor is able to then transfer the more specific concepts to the student within the schema itself, giving the student a wider view of what they are receiving through transfer and keeping them from having too narrow a focus on small concerns that students may have about their writing (Devet, 125-126). This process can also take place as procedural-to-declarative knowledge. In this condition, specific knowledge is generalized and is able to be conveyed to an audience that may not be intimately familiar with it (Devet, 126). This method of learning transfer takes place within our study related to tutor learning. When tutors are able to receive information about the assignment-specific subject knowledge that they receive from the assignment-specific training, they are able to use procedural-to-declarative knowledge, taking the procedural knowledge that they have and applying it to the training that they have received for the specific genre and subject matter conventions that have been transferred to them. Moving between procedural-to-declarative and declarative-to-procedural provides a foundation that grounds our study to maintain relevancy within the field of educational psychology.

According to Robert E. Haskell (76-79), the understanding of learning transfer has changed greatly over time. The early 1900s ushered in a wave of research focused on improving instructors’ ability to facilitate transfer. The formal method of transfer that had been utilized at that time has since been replaced by other methods; one of the most common of these methods is the metacognition model (Haskell, 84). This model is “composed of self-monitoring strategies” which can be used to facilitate transfer “within and across tasks or learning domains” (Haskell, 84).

Genre awareness can also instigate transfer from one area of study to another (Devet, 134-135). It can be assumed that if a writing tutor is taught the basics of genre theory and writing conventions within a discipline, they will have the ability to transfer learning between subject areas more easily, and continuously improve as a tutor over time.

Genre Theory and Writing Within the Disciplines

First-year composition classes often do not prepare students to write for specific genres. In fact, there may be an expectation from faculty who do not teach writing or composition that their students should be fully prepared for any writing assignment once they have completed a first-year composition or introductory writing class (Devitt, 223). Unfortunately, this expectation is an unrealistic one, and a basic writing course outside of a student’s genre will not be enough to prepare them to write within their field. As Devitt states, a research paper from a first-year writing course “may not, in fact, be the most effective antecedent genre for the biology major’s paper” (223). The transfer of learning that a tutor may receive in their training or coursework to become a tutor may be similar. Writing tutors are instructed in the acceptable methods of helping to create better writers, often referred to as writing center lore (Nordlof, 48). Unless a tutoring program is intended to focus on one genre, however, tutors may not be adequately prepared for work in every genre and will need to employ a heuristic that can be utilized across different areas of study.

The need for tutors to be able to work with students across genres is central to their ability to conduct a successful session. As a result, training a student to be a writing center tutor must prepare them to work with a variety of genres and writing conventions. If tutors have been trained to work with students in a variety of genre conventions, they can explain the writing conventions of the student’s discipline. Tutors can also use genre theory to scaffold in the writing center when they are not familiar with the subject matter that students are working with. The ability to look at writing and genre conventions within

their field can help tutees to understand how their writing fits into the standards and practices of their field as it has evolved over time (Gordon, 4).

Being able to tutor to specific conventions and genres does not provide a perfect solution to a tutor's lack of subject matter knowledge. While it may not prove helpful to directly teach the relevant technical material to tutors during tutor training, focusing on the basics of genre can provide a necessary bridge. In examining their own experience of tutors with and without subject matter knowledge, Dinitz and Harrington find that when a tutor has experience in the subject matter a student is writing about, they are able to "be more directive in ways that enhance collaboration" (74). However, they also acknowledge that tutor confidence plays a major role in the session quality when tutors lack experience in students' subject matter. Dinitz and Harrington note that tutors may have felt the "session needed to move in a different direction but seemed to lack the confidence to push back on students' ideas, assessments of their work, and goals for the session" (94), ultimately holding students back from reaching their true potential in the session. The tutor training method used in this study addresses the issue of tutor confidence, ideally providing students with the most effective writing assistance possible. Providing assignment-specific training to the tutors has the potential to improve the quality of sessions (Weissbach & Pflueger, 215).

Embedded Tutoring

Embedded tutoring is another effective method of discipline-specific tutoring that incorporates a tutor within the structure of a course. Some programs have included tutors actually in a class section to offer individual tutoring, while others have included writing workshops during content-class time (Dansereau, et al.) and, when using specialist tutors with experience in the discipline, showed improvement in student grades (74). The tutor-training method in this study is not strictly an embedded model. In an embedded model, the writing tutor visits the class and works with the instructor, often within the class time. In this novel method, the students are introduced to the writing center by the instructor and the director of the center, but do not encounter peer tutors until they arrive at their appointment in the center. Peer tutors are trained on the specific assignment, but they are never integrated into the class.

Assignment-Specific Tutor Training

Using tutors who have already been trained in assignment-specific pedagogical methods can be of great benefit to students. There can be just as much

benefit for the tutors as well. If tutors are provided with a layman's understanding of the tutee's vocabulary and subject matter, they may be better prepared to give useful feedback and feel as if they have better control of the session (Scrocco). Training writing tutors for specific assignments can help them to feel less intimidated by the material and more capable of helping the student improve their writing (Weissbach & Pflueger, 208). Additionally, specialized training may improve the quality of tutoring that a student may receive, advancing their writing capabilities within the genre they will ultimately use in a professional setting. Both Carino and Diana Awad Scrocco reinforce the potential benefits this methodology brings to the tutoring process, as tutors can adapt to material that is unfamiliar to them through seeing examples of what instructors expect, "even if only in the form of copies of successful papers from past students" (113). The novel tutor training method used by Robert S. Weissbach and Ruth C. Pflueger (214-215) provides just this kind of instruction to assist peer tutors in successfully helping students improve knowledge of discipline-specific writing genres. Tutors are thoughtfully trained in the details of tutoring specific types of assignments. Additionally, tutors' responses in the tutor training session are a central point of the training, and these tutors are able to take ownership of their learning during the process so they can better help the students. Tutors are given information about the content of the class; details of the specific assignment and specialized terminology are explained. They are given samples of the reports they will see so they can identify features of a "good report" in comparison to a report that needs significant improvement. All of this takes place approximately one week prior to the tutoring so it is fresh in their minds. For these reasons, this current study replicated and expanded upon the original study to gather additional insights.

Methods

All study information was submitted to the IUPUI Institutional Review Board (IRB) and was approved with exempt status (IRB protocol #1805345879).

Sample

For this study, student participants from two U.S. universities—one in the Midwest (Site 1) and one in the Southwest (Site 2)—were recruited from a one-semester engineering course where the instructor agreed to participate by assisting with the tutor training. Participation included a required visit to the writing center for one specific writing assignment in that

course. Tutor participants were recruited by the writing center directors. In total, six tutors tutored (and completed logs for) fifteen students, four of which were from Site 1 and eleven of which were from Site 2.

Instruments and Data Collection

Assignment-specific tutor training provided tutor participants with a non-technical explanation of the report assignment given by the class instructor. The instructor and PIs reinforced the tutors' training, explaining that their skill set was a valuable resource for the engineering students they would be tutoring. Tutors were provided with examples of good and poor lab reports for that particular assignment, as well as the tutor checklist and tutor log. At the end of the training session, tutors completed the tutor pre-participation survey. This survey collected information about tutor confidence levels and experience with tutoring engineering students prior to participation.

Classroom visits to the engineering class sections participating in the study were conducted by the PI and the director of the writing center. Students were provided with information about the study and were invited to participate. Although the course required students to visit the writing center as part of their assignment, their participation in the study was voluntary and did not affect the student's ability to complete the class or their grade. Those students who elected to participate in the study were given student pre-participation study information forms and an initial survey. The form explained the study in writing and provided participant consent from the student, and the survey collected initial information about the engineering students' individual perception of the potential for writing tutors to effectively help them improve their lab reports. Students who agreed to participate in the study also allowed the PIs to look at a (deidentified) copy of their report draft before tutoring and after revising (the final version submitted to the instructor).

Tutors completed a tutor log for each student who visited the writing center after completion of the session. After the conclusion of the study, post-participation surveys were administered to students and tutors. Students were given a post-participation survey to re-evaluate their perception of the effectiveness of a writing tutor in helping them improve their lab reports. Writing tutors were given a post-participation survey to evaluate their confidence in their ability to effectively tutor engineering students following their experience in the study.

Although all data were analyzed, only data from the tutor post-session evaluation and the student pre-survey instruments were utilized for this analysis, since

they were the only ones to show statistical significance. While the other instruments did show potentially favorable results, a larger sample size is needed to determine significance. The tutor post-session survey statements that tutors responded to are provided in Table 1.

A survey was given to student participants both pre-session and post-session with slight modification to tense. For example, if the pre-survey stated "I feel that a writing tutor can show me. . ." the post-survey stated "the writing tutor showed me. . ." Emails were sent to students using the Qualtrics online survey instrument both before and after their session. All questions on the survey used a four-point Likert scale including strongly disagree, disagree, agree, strongly agree. A scale-score mean was established for each student by averaging their responses across the survey. Table 2 provides the student pre-survey statements.

Results and Analysis

Statistical Analysis

All analyses were run using SPSS v26. For tutors at each university, a multiple linear regression was calculated to predict how a tutor rated the initial quality of a student's work before tutoring, the student's attitude before tutoring (as measured by their pre-score average mean), and the tutor's perception of whether or not the student was interested in their suggestions about content. A significant regression equation was found ($F(3,11)=5.298, p<.05$), with an R^2 of .591 and an adjusted R^2 of .479. The model predicted that the quality score is equal to $.849 + -2.707$ (Location) + 2.822 (If interested in content suggestions) + 1.751 (Student pre-scale mean), where location is coded as 1 or 2, interest in content suggestions is coded as 0 or 1, and student pre-scale mean ranges from 1 to 4. Both location and student interest in content suggestions were statistically significant. The coefficient output can be found in Table 3 below. No other models run were significant or provide the predictive power of this model.

Figure 1 shows a scatterplot of the tutor-assessed quality of the students' initial paper versus the aggregated standardized values of the independent variables. This indicates that there is a probable correlation between the tutor rating of the initial quality of the student work, the student attitude before tutoring, and the tutor's perception of whether or not the student was interested in their suggestions about content at Site 2. Additional data should be collected with larger Ns to determine if any other correlations exist.

Student Attitudes Toward the Writing Center

The data from the multiple regression analysis suggests that students' attitude toward the writing center could be a factor in their engagement during the tutorial. In this study, we are defining student engagement as taking notes and/or asking questions during the tutorial.

When asked if they had previously used a writing center, of the total of 11 students at Site 2, eight students responded "no" and three students responded "yes." Two engineering students who had previously used the writing center had used it only for general, non-course-related writing. This could imply that the students in this sample did not see the connection between the writing in their first-year composition courses and the writing in their engineering courses. If this is true, this is something that often signifies a lack of genre awareness and the ability to transfer one type of writing knowledge to another (Kohn; Devitt, 216-217). Helping these students to understand that relationship could be beneficial.

Students' responses to other items on their pre-participation questionnaire indicate that, while they may not have visited a writing tutor prior to this, they felt as though there was value in working with a tutor, which could also be a factor in how much they choose to engage in the tutorial. Table 4 shows that the engineering students perceived an inherent value in tutoring when asked how they thought a writing tutor may be able to help them improve their work.

The data in Table 4 suggests that these engineering students—with the exception of one "disagree"—all strongly agreed or agreed with the statements that a writing tutor would be able to help them with the quality of their lab reports. Interestingly, the statement with the lowest amount of agreement overall was "I feel that a writing tutor can help me follow the proper format and referencing of figures in my report." Further investigation of this statement may provide us with more detailed information of the perception of figures and tables that engineering students have about their reports and why they feel less confident in a writing tutor's ability to help them in that specific area.

Overall, the results show a high perceived value of writing tutors within the engineering student sample analyzed in this study.

Tutor Perception of Student Engagement

The other statistically significant variable was the data from the tutor post-session evaluations. Tables 5 and 6 display the engagement that tutors reported from observing the engineering students during their sessions and the tutors ranking of their agreement with the statements about student engagement.

This data supports student engagement in the sessions, with tutors reporting that ten of the eleven students strongly agreed or agreed that students were receptive to suggestions and wanted to understand the reasons/rules behind those suggestions. Eight of the eleven asked questions during the session, and only one student indicated that the tutor needed to have specialized knowledge about the subject matter in order to tutor the subject matter. The relationship between the student and the tutor seems to be one of mutual understanding: both perceive a value that the tutor is able to provide to the student. Based on the significance of the relationship between these two variables, it seems as though the tutor training may have created an environment within the writing center that prompted the engineering students to be more receptive to the tutors' suggestions.

There were also three written comments from tutors in the session evaluations that indicate students were engaged in the session and actively sought information from the tutor. Two mention student receptivity or responsiveness:

The student did not seem to know at first that his writing should connect with a general audience. However, he was receptive when I suggested that he define the technical terms.

and

The student was responsive to my suggestions and was quick to understand my reasoning.

The third comment describes a situation in which schedule deterred the tutor and student from having a full session, although it does not speak to the quality of the session itself:

The session felt short because I was finishing my shift, and the student had to leave to a class, unable to stay and wait for another tutor.

The results from the tutors' point of view indicate that they felt as though the engineering students were receptive to their comments and seemed to be engaged in the session. Three students left comments that support the quantitative data as well: "It honestly was a good resource," "Keep it up," and "Wonderful to work with" were the comments left by students. While this data could be dependent upon a number of variables, the statistical significance of the relationship indicates that although there is a small N for this sample, there is a relationship that cannot be explained purely by chance and is worth further exploration.

Future Studies

Results of this study cannot be generalized because of the small N; however, the institutions involved are continuing to conduct research and improve the

training based on results. While not an embedded tutoring program, this model does show promise for assignment-specific tutor training. Future research should include continued replication and expansion to test larger sample sizes, analysis of impact within and adaptations for other STEM areas, tutor self-efficacy, instructor and the impact of using this method on tutoring team projects. Other potential areas for future research could include looking at the combined direct and non-direct approach and implications for populations who speak English as an additional language.

One of the major barriers to beginning a program within a writing center is the issue of allocation of time and funds. As stated previously, writing centers are often underfunded and lack resources. This new type of training can benefit institutions because it relies on existing resources. Although there is an initial investment of time from the instructors, it is expected that the student writing in the final assignments will improve, which has the potential to reduce instructor workload. This needs to be tested and examined further. In addition, once refinements are made, this model can be adapted to and tested in a variety of contexts. Investigation of other STEM disciplines and classes may provide additional data to further elucidate the effects of this type of training on both students and tutors.

Instructor emphasis of the value of the writing center to the students was not examined here and could play a part in student attitudes toward the writing center. Future iterations of this study may benefit from looking at instructor perceptions of and emphasis on writing skill development. Current literature within the field suggests that some STEM instructors do not place a strong emphasis upon writing as a skill to be developed within the STEM classes (Kohn), which suggests that this may be an area of further investigation.

In addition, in future studies it would be interesting to look at demographic data students. In particular, gathering demographic data may alert writing centers to challenges that students who speak English as an Additional Language (EAL) face when learning to write within their discipline. EAL students are faced with the task of working within a second language as they are “simultaneously encountering and negotiating new national, local, institutional, and disciplinary cultures” (Craig, 215). Studies suggest that EAL students may benefit from a mix of directive and non-directive tutoring (Craig, 231-232; Thonus, 239-240). Collecting further data may better inform the instruments and methods in future iterations.

Since many classes within STEM fields include a variety of team projects, the utilization of this method within team or group tutoring sessions seems to be a natural next step. Teamwork within an academic setting is a valuable precursor to the necessary collaboration in the workplace, especially for STEM students. By preparing students during their academic career, they may be better prepared for group collaboration and writing for a variety of audiences and purposes when they arrive in the workplace.

Future replication of this study may also provide the larger sample sizes necessary to find potential statistical significance among a greater number of variables. The small N of this study limited the measurement of external validity that could be obtained. With further replication, external validity could be increased by expansion to a number of settings. This may include institutions of a variety of sizes or demographic makeups. In this small sample, it appears that writing centers are perceived as being valuable by engineering students, and although more research needs to confirm this, it is possible that by training the tutors in discipline-specific writing conventions, students may become more engaged in their own writing improvement. Continued research in this area will contribute to the improvement of tutor training programs and the important work of writing centers.

Works Cited

- Berghmans, Inneke, et al. “A Typology of Approaches to Peer Tutoring: Unraveling Peer Tutors’ Behavioural Strategies.” *European Journal of Psychology of Education*, vol. 28, no. 3, 2013, pp. 703-723. *BASE*, doi:10.1007/s10212-012-0136_3.
- Boquet, Elizabeth H. “‘Our Little Secret’: A History of Writing Centers, Pre- to Post-Open Admissions.” *College Composition and Communication*, vol. 50, no. 3, 1999, pp. 463-482. *JSTOR Journals*, doi:10.2307/358861.
- Carino, Peter. “Power and Authority in Peer Tutoring.” *The Center Will Hold: Critical Perspectives on Writing Center Scholarship*, edited by Pemberton, Michael A., and Joyce A. Kinhead, Utah State UP, 2003, pp. 96-113.
- Craig, Jennifer. “Unfamiliar Territory.” *Tutoring Second Language Writers*, edited by Bruce, Shanti, and Bennet A. Raftery, Utah State UP, 2016, pp. 212-234.
- Dansereau, David, et al. “Building First-Year Science Writing Skills with an Embedded Writing Instruction Program.” *Journal of College Science Teaching*, vol. 49, no. 3, 2020, pp. 66-75.

- Devet, Bonnie. "The Writing Center and Transfer of Learning: A Primer for Directors." *The Writing Center Journal*, vol. 35, no. 1, 2015, pp. 119-151. <https://www.jstor.org/stable/43673621>.
- . "How Tutors of Academic Writing Can Use the Theory of Transfer of Learning." *Journal of Academic Writing*, vol. 8, no. 2, 2018, pp. 191-201. <http://dx.doi.org/10.18552/joaw.v8i2.437>.
- Devitt, Amy. "Transferability and Genres." *Locations of Composition*, edited by Keller, Christopher J., and Christian R. Weisser, State U of New York P, 2007, pp. 215-227.
- Dinitz, Sue, and Harrington, Susanmarie. "The Role of Disciplinary Expertise in Shaping Writing Tutorials." *The Writing Center Journal*, vol. 33, no. 2, 2014, pp. 73-98. <https://www.jstor.org/stable/43443372>.
- Gordon, Layne M. P. "Beyond Generalist vs. Specialist: Making Connections Between Genre Theory and Writing Center Pedagogy." *Praxis*, vol. 11, no. 2, 2014, pp. 1-5. <http://hdl.handle.net/2152/62041>.
- Haider, Mehwish, and Yasmin, Aalyia. "Significance of Scaffolding and Peer Tutoring in the Light of Vygotsky's Theory of Zone of Proximal Development." *International Journal of Languages, Literature and Linguistics*, vol. 1, no. 3, 2015, pp. 170-173. <http://www.ijlll.org/vol1/33-L310.pdf>.
- Haskell, Robert E. *Transfer of Learning: Cognition, Instruction, and Reasoning*. Academic Press, 2001, EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=cac06315a&AN=iui.15298222&site=eds-live.
- Kail, Harvey. "Collaborative Learning in Context: The Problem with Peer Tutoring." *College English*, vol. 45, no. 6, 1983, pp. 594-599. *JSTOR Journals*, doi:10.2307/377146.
- Kohn, Liberty L. "Can They Tutor Science? Using Faculty Input, Genre, and WAC-WID to Introduce Tutors to Scientific Realities." *Composition Forum*, vol. 29, 2014. ERIC, <https://eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1021998>.
- Nordlof, John. "Vygotsky, Scaffolding, and the Role of Theory in Writing Center Work." *The Writing Center Journal*, vol. 34, no. 1, 2014, pp. 45-64. <https://www.jstor.org/stable/43444147>.
- Perdue, Sherry Wynn., and Driscoll, Dana Lynn. "Context Matters: Centering Writing Center Administrators' Institutional Status and Scholarly Identity." *Writing Center Journal*, vol. 36, no. 1, 2017, pp. 185-214. <https://www.jstor.org/stable/44252642>.
- Raign, Kathryn. "Learning About Something Means Becoming Wiser: The Platonic Dialogue as a Pragmatic Model for Writing Center Practice." *Praxis*, vol. 14, no. 3, 2017, pp. 32-40. *BASE*, doi:10.15781/T2DJ58Z3H.
- Scrocco, Diana Awad "Reconsidering Reading Models in Writing Center Consultations: When is the Read-Ahead Method Appropriate?" *Praxis*, vol. 14, no. 3, 2017, pp. 10-20. <http://www.praxisuwc.com/diana-awad-scrocco-143>.
- Thompson, Isabelle. "Scaffolding in the Writing Center: A Microanalysis of an Experienced Tutor's Verbal and Nonverbal Tutoring Strategies." *Written Communication*, vol. 24, no. 4, 2009, pp. 417-453. *SAGE*, doi:10.1177/0741088309342364.
- Thonus, Terese. "What Are the Differences? Tutor Interactions with First- and Second-Language Writers." *Journal of Second Language Writing*, vol. 13, no. 3, 2004, pp. 227-242. *BASE*, doi:10.1016/s1060-3743(04)00015-3.
- Turner, Melissa. "Writing Centers: Being Proactive in the Education Crisis." *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, vol. 80, no. 2, 2006, pp. 45-47. *EBSCO Management Collection*, doi:10.3200/tchs.80.2.45-47.
- Weissbach, Robert S., and Pflueger, Ruth. C. "Collaborating with Writing Centers on Interdisciplinary Peer Tutor Training to Improve Writing Support for Engineering Students." *IEEE Transactions on Professional Communication*, vol. 61, no. 2, 2018, pp. 206-220. *EBSCOhost*, doi:10.1109/TPC.2017.2778949.

Appendix
Tables and Figures

Table 1: Tutor Post-Session Survey Statements

Table 1 |

Tutor Post-Session Survey Statements

Statements	Response Type
Student took notes during the sessions	Yes/No
The student asked questions during the session	
The student(s) implied or stated that I needed specialized knowledge to understand paper's content	
The student seemed receptive to my suggestions	4-pt Likert
The student wanted to understand the reasons/rules behind my suggestions	
The student was interested in my suggestions about: Grammar Style Content Format/Citations Other	Check box
The Length of the tutoring session was: About Right Too Short Too Long	Check box

Table 2: Student Pre-Participation Survey

Table 2

Student Pre-Participation Survey

Student Pre-Participation Survey Statements
1. I feel that I writing tutor can show me how to make the meaning of my sentences clearer.
2. I feel that a writing tutor's explanations about grammar and punctuation errors can help me to identify other errors in my lab report.
3. I feel that a writing tutor can show me ways to strengthen the analysis section of my report.
4. I feel that a writing tutor can help me follow the proper format and referencing of figures in my report.
5. I feel that a writing tutor can show me ways to improve my writing style so that sentences in my report sound more professional.
6. I feel that a writing tutor can help me improve the overall quality of my report as the result of a tutoring session.

Table 3: Coefficients of Multiple Linear Regression Model

Table 3

Coefficients of Multiple Linear Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.849	3.503		.242	.813
Location	-2.707	.802	-.677	-3.374	.006
The student was interested in my suggestions about content	2.822	1.075	.542	2.626	.024
Pre-Mean	1.751	.868	.406	2.018	.069

Figure 1: Scatterplot Showing the Multiple Linear Regression Model

Figure 1

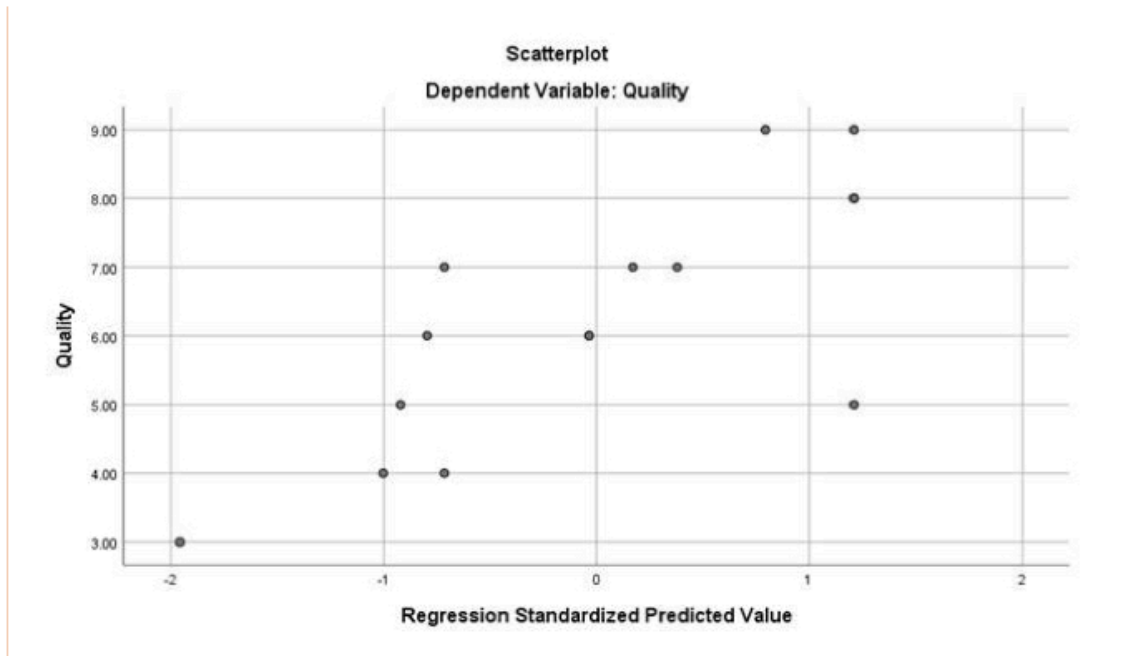


Figure 1. Scatterplot of the linear regression model

Table 4: Student Pre-Participation Survey Results

Table 4

Student Pre-Participation Survey Results

	I feel that a writing tutor can show me how to make the meaning of my sentences clearer.	I feel that a writing tutor's explanations about grammar and punctuation errors can help me to identify other errors in my lab report.	I feel that a writing tutor can show me ways to strengthen the analysis section of my report.	I feel that a writing tutor can help me follow the proper format and referencing of figures in my report.	I feel that a writing tutor can show me ways to improve my writing style so that the sentences in my report sound more professional.	I feel that a writing tutor can help me improve the overall quality of my report as the result of a tutoring session.
Strongly agree	6	9	7	6	7	8
Agree	5	2	4	4	4	3
Disagree	0	0	0	1	0	0
Strongly disagree	0	0	0	0	0	0

Table 5: Student Engagement During Session

Table 5

Student Engagement During Session (Observed by Tutor)

	Student(s) took notes during the session	The student(s) asked questions during the session	The student(s) implied or stated that I needed specialized knowledge to understand paper's content
Yes	4	8	1
No	7	2	10
Missing	0	1	0

Table 6: Tutor Agreement of Student Engagement

Table 6

Tutor Agreement of Student Engagement

	The student(s) seemed receptive to my suggestions	The student(s) wanted to understand the reasons/rules behind my suggestions
Strongly agree	8	4
Agree	2	6
Disagree	1	1
Strongly disagree	0	0