Examining self-efficacy and transferable skills within specialized tutor training

Abstract

Peer writing tutors in the humanities often feel less comfortable working with students outside their own discipline. When tutors work with students in STEM fields, this discomfort can be exacerbated by a lack of familiarity with both discipline-specific knowledge and genre conventions. As a result, tutor confidence may suffer and the tutee may not receive optimal assistance. A novel tutor training model was developed to ameliorate this issue by conducting assignment-specific tutor training for tutors who work with students in engineering programs (X & Y, 2018). Initial studies have examined perceptions of and interactions between tutors and tutees and have received positive initial results. This method is currently under replication and expansion at two universities.

The current study examined tutor self-efficacy in tutors who participated in the assignment-specific tutor training. Expanding this research to a larger sample size would allow a more thorough examination of the three themes from this study including the self-efficacy of tutors, the transfer and professional development of tutors, and the effects of the relationship between the STEM instructors and the tutors. Writing centers that invest in development of tutor self-efficacy could create better experiences for all students, especially those whose work falls within STEM genres.

Introduction

Writing tutors within the humanities often feel that they are not adequately prepared to tutor students in STEM (science, technology, engineering, and math) fields (Liberty Kohn, 2014; X & Y, 2018). While tutor training classes or programs are intended to prepare tutors to provide interdisciplinary help, tutors may feel less comfortable working with content they are not well-versed in. As a result, tutors may feel less confident in their tutoring abilities. When tutors lack confidence in their abilities, they may not provide the best guidance needed to improve student writing. Writing centers can benefit from training programs that help tutors build confidence working with STEM writing. An assignment-specific tutor-training method (X & Y, 2018), provides a unique opportunity to examine tutor self-efficacy, transfer, and the relationship

between the STEM instructor and the tutor. This current paper looks at self-efficacy in data from tutors who participated in this assignment-specific tutor-training method. The results of this study could initiate a new area of tutor research.

A handful of studies have investigated the effects peer tutoring has on the professional and personal lives of former tutors and what these former tutors feel that they have gained from their experiences (Bradley Hughes, Paula Gillespie, & Harvey Kail, 2010; Dayna Jean DeFeo & Fawn Caparas, 2014; Dana Lynn Driscoll, 2015), but much room remains to expand this area of research.

The Peer Writing Tutor Alumni Research Project (PWTARP) (Hughes, Gillespie, & Kail, 2010), collected data from former peer writing tutors. This included personal reflections of their time as writing tutors and self-reported insights of the effects that their role as a writing tutor has had on their lives. Continued collection of tutor data will provide a valuable resource for writing center researchers, including the exploration of the long-term transfer of learning from writing centers.

While PWTARP collected valuable data from former peer writing tutors, it has not utilized a scale to measure tutor self-efficacy. Self-efficacy is defined by Albert Bandura (2006) as the confidence in one's ability to achieve a specific task. In the case of a writing tutor, this may take the form of specific tasks within a tutor's job when tutoring a student from a particular area of study. These measurements could impact future tutor training and have the potential to improve the training process. Self-efficacy could be a crucial part of measuring the impact that tutoring may have upon a tutor after they leave the writing center and how they transfer skills to other areas.

An ongoing study explores the relationship between assignment-specific tutor training and the potential for improved writing center sessions for engineering students. From 2012–2014, researchers at Site 1 developed and began testing a novel method of tutor training (X & Y, 2018). This tutor training model is tailored to an instructor-specified assignment, and interdisciplinary training is carried out by the director of the writing center and the instructor of the class. Initial studies yielded positive results in improved tutor confidence for the engineering students who utilized writing center resources. In 2018, researchers at Site 2 received a seed grant to conduct this study at two locations. Site 3 was chosen as a replication of the original study because the tutor population is similar to that of Site 1, with tutors who have backgrounds in the humanities and tutor writing from many fields. Site 2 was chosen as an expansion of the study in a technical communication writing center, which focuses on writing done in technical and engineering fields. In the spring of 2019, the training method was also replicated at the Site 4, a school with a large population who speak English as an additional language, adding another facet to the variety of data to be evaluated.

Writing center pedagogy and practice can vary depending on the writing center and the method of tutor training (Donna Kain & Elizabeth Wardle, 2005; John Nordlof, 2014; Leigh Ryan & Lisa Zimmerelli, 2016; Kathryn Raign, 2017). The creation of accepted standard practices to train writing tutors is necessary for the field to progress and have a common body of knowledge. Part of the training should involve knowledge transfer theory and the benefit to the tutors after they have left the writing center. Future expansion of this study may provide insight into tutor benefits, both in their personal and professional lives, through self-efficacy and transfer of learning.

Literature Review

Genre theory and interdisciplinary writing

Writing center tutors must be prepared to work with students in a variety of concentrations. As a result, training a student to be a writing center tutor must prepare the student for a variety of subject matter topics. An example of this would be training a tutor with a background in the humanities to learn the discipline-specific writing conventions of STEM fields. When assisting a student with a lab report, the tutor may not be familiar with the material that the student is discussing. The tutor can, however, help the student to make decisions based upon the genre conventions associated with a standard lab report (Ryan & Zimmerelli, 2016). Where subject knowledge is lacking, genre theory is able to help the students scaffold their ideas into a report that they have created within the parameters dictated by their field. Genre theory can play an important role in training writing tutors to work with a variety of students who may be writing in a wide variety of genre conventions. Tutors who are able to explain the reasoning behind the structure of an assignment may help the tutee to understand how their writing assignment is "something that is part of a tradition of looking at the world in a particular way" (Layne M. P. Gordon, 2014, p. 4). For this reason, tutors should be able to draw upon some knowledge of genres different from their primary backgrounds.

An interdisciplinary approach to genre requires that tutors have a working knowledge of writing styles across genre boundaries as well as the specific demands of individual genre conventions and standards. (Kohn, 2014; Ryan & Zimmerelli, 2016). Kohn's observation of these practices within a humanities-based writing center suggests that instructing writing center tutors in genre conventions of science writing will give them the necessary skills to provide quality tutoring sessions to STEM students (2014). Giving tutors a working knowledge of the rhetorical conventions of a lab report or scientific paper could result in a more effective tutoring session.

Tutors who are able to analyze subject-specific writing from a genre viewpoint will be able to help science students improve their writing without detailed knowledge of the technical material itself (Kohn, 2014).

Transfer of learning in peer tutoring

Best practices in the field of tutor training often include a period of time set aside for new tutors to shadow current tutors in the writing center. This example of the use of transfer in the writing center provides a glimpse of one way that knowledge transfer takes place during a tutor's time working in the writing center. Transfer as defined by Bonnie Devet (2015) states that transfer, at its foundational level, consists of "seeing similarities to what is already known," and by doing such it allows the learner to apply that knowledge to a similar task (p. 121). These articles accentuate the fact that the process of knowledge transfer can take place not only from one person to another, but also from one area of knowledge to another.

Transfer processes have the potential for writing practices learned in school to be applied to a variety of genres within the workplace. However, facilitating transfer of genre knowledge is difficult to attain, and often the methods that colleges or universities use to teach genre do not achieve this goal (Kain & Wardle, 2005). Some classes teach student writing with the intent of giving students transferrable skills to use beyond the scope of the classroom, with the goal of improving their higher-level writing abilities to apply to situations outside of the class (Driscoll, 2015).

The PWTARP (Hughes, Gillespie, & Kail, 2010) has begun to explore the effects that peer tutoring has had after the tutor has left the writing center. The initial results of this study have shown that the effects of being a peer writing tutor has had a deep impact on former tutors in

many areas of their lives. The PWTARP's findings indicate that some transfer from the writing center is already occurring. The respondents, former peer writing tutors, reported working in a variety of fields and concentrations, and describe a wide variety of tools they gained as tutors that they have used within their careers (Hughes, Gillespie, & Kail, 2010, p. 21). Many areas surrounding the idea of transfer remain unexplored, however.

The goal of acquired experience in transfer of learning should be to carry over these skills from the university to the workplace. In the university, writing tutors must continually adapt and adjust their method and focus as they work with one student after another, moving among genres and assignments. Tutors are able to develop a strong ability to transfer their learning as a result of this constant change. This continuous change and adaptability is a necessary skill as organizations become more dependent on technology for their writing and communication needs. It is increasingly important for writers in the workplace to take these theories of transfer with them to adapt. Sometimes called the Fourth Industrial Revolution or Industry 4.0 (Vander Luiz da Silva, João Luiz Kovaleski, & Regina Negri Pagani, 2019), the current increase in adaptation of technology in the workplace demands a workforce that is able to adapt to the new technology and processes that are arising. Transfer of learning is a crucial aspect of this workforce adaptability (da Silva, Kovaleski, & Pagani, 2019). Writers in the workplace will be expected to be flexible in their writing style as they encounter writing programs and content management systems that will change the way that they use the techniques that they learned within an educational setting. Denise K. Comer (2017) states that transfer should be "taking into account the ways in which context shapes and reflects ideas" (p. 10). The current increasingly-changing concepts and ideas related to writing in the workplace, coupled with the use of new technology, demands the ability to move seamlessly from one method of writing to another.

Self-efficacy and writing tutors

Self-efficacy is defined by Bandura (2006) as "people's beliefs in their capabilities to produce given attainments" (p. 307). It does not measure the actual capability of a person to reach a goal; rather, it measures the confidence a person has that they will be able to reach a goal. Self-efficacy is limited to specific tasks or actions and is not a measurement of a person's confidence in all areas. Bandura tells us that it "must be tailored to the particular domain of functioning that is the object of interest" (p. 308). In the writing center, self-efficacy might take the form of feeling capable of performing certain tasks, such as helping a student compose a paragraph or explaining the proper use of a comma. By measuring tasks of self-efficacy after a training session for the ASTT program, the self-efficacy of peer writing tutors can be analyzed in relation to tasks specific to working with STEM students.

Self-efficacy can play a major role in the ability of a writing tutor. While a tutor may be fully qualified and capable of providing an effective session for a student, their ability to do so may be negatively affected by a lack of self-efficacy. Devet (2015) states that "for transfer to occur, consultants must also believe they have the capability to do their work". Dana Lynn Driscoll & Jennifer Wells (2012) state that self-efficacy is a disposition that, when present, increases the likelihood of transfer, acknowledging the connection between the two. Jo Mackiewicz & Isabelle Kramer Thompson (2015) state that self-efficacy is a good predictor of what students will accomplish with their skillset as well as "how much effort they will invest in learning new knowledge and skills" (p. 39). When writing tutors are engaged in a process of transfer of learning, either during their training or during the practice of tutoring itself, the ability to apply knowledge from a particular situation or experience to other contexts may have the potential to result in greater reported self-efficacy.

In the past few decades, educational psychologists have developed specialized tools to study the self-efficacy beliefs of instructors. Instruments such as the Mathematics Teaching Efficacy Belief Instrument, or MTEBI (Larry G. Enochs, Phillip L. Smith, & DeAnn Huinker, 2000), the Science Teaching Efficacy Belief Instrument, or STEBI (Larry G. Enochs & Iris M. Riggs, 1990), the Teaching Writing Scale (Steve Graham, Karen R. Harris, Barbara Fink, & Charles A. MacArthur, 2001), and the Electronic Quality of Inquiry Protocol (Christine R. Lotter, Stephen Thompson, Tammiee S. Dickenson, Whitney F. Smiley, Genine Blue, & Mary Rea, 2016) have been used to measure the self-efficacy of instructors.

Although there are several measurement tools for teachers in a variety of concentrations, little research has been conducted concerning the self-efficacy of tutors. A recent study by Roger Powell & Kelsey Hixson-Bowles (2018) is one of the few studies to specifically examine the self-efficacy of tutors. Their measurement instrument was based upon the Post Secondary Writerly Self-Efficacy Scale developed by Katherine M. Schmidt & Joel E. Alexander (2012), which had been developed to measure the self-efficacy of students who visited the writing center. Schmidt & Alexander's study measured the self-efficacy of writers who visited the writing center and their feeling of being able to perform well on tasks involving writing. Powell & Hixson-Bowles adapted Schmidt & Alexander's study to create a scale that could be used for tutors, rather than students, providing data from tutors and measuring their feelings of self-efficacy around tutoring tasks.

Transfer of learning and self-efficacy are outcomes that appear consistently in writing center studies, yet the replicable, aggregable, and data-supported (RAD) research that has analyzed tutor development both during their time as a tutor and after they leave the writing center is lacking (Dana Lynn Driscoll & Sherry Wynn Perdue, 2012). Self-efficacy within the writing

center has not been studied in great detail, but as a fairly accurate predictor of future success, it is clear that more research needs to be done to analyze how writing tutors can develop self-efficacy during their time in the writing center. It is for this reason that this study was designed to look at the self-efficacy of the tutors who participated in this assignment-specific tutor-training.

Methodology

This sequential mixed methods study served as a pilot to investigate the relationship between the assignment-specific tutor training and the possible transfer of learning. In addition, we are examining the effects of the training on tutor self-efficacy. Since there is no pre-existing data for comparison, the goal of this data collection is not to generalize any of the findings, but to analyze descriptive statistics to provide a baseline measurement and identify areas of further study.

Research questions for this study are as follows:

1. What effect does assignment-specific tutor training have on the potential to develop self-efficacy?

2. Does assignment-specific tutor training contribute to the professional development of writing tutors and their ability to transfer learning to future positions and careers?

3. What effect does assignment-specific tutor training have on the working relationship between writing tutors and STEM instructors?

This study was submitted to IRB and approved as exempt (IRB protocol #1905886980).

Participants

Participants were recruited by email from four writing centers at three universities. Since the assignment-specific tutor training method took place at only these four writing centers, 30 tutors

total were eligible for participation, which limits the sample size. Contact information for these 30 tutors was obtained from the directors of the writing centers. An invitation to complete the questionnaire was emailed to the 30 tutors, with reminder emails scheduled one and two weeks after the initial email. Seventeen tutors responded to the questionnaire. Three responses were incomplete and discarded from the data analysis. Of the remaining 14 responses, one tutor had not participated in the training. This response was not included in the data analysis to prevent skewed data. The remaining 13 responses make up the data used in the analysis. Tutors' institutional affiliations are shown in Table 1.

Table 1

Institutional affiliation of respondents

	Number	Percent
Institution 1	1	7.69
Institution 2	4	30.77
Institution 3	3	23.07
Institution 4	5	38.46
Total	13	100

Gender, race/ethnicity, and class standing demographics were collected from these 13 tutors and are shown in Tables 2, 3, and 4.

Table 2

Gender of respondents

	Number	Percent
Male	4	30.77
Female	9	69.23
Other	0	0
Prefer not to say	0	0
Total	13	100

Table 3

Race/ethnicity of respondents

	Number	Percent
American Indian or Alaskan Native	0	0.00
Asian/Pacific Islander	2	15.38
Black or African American	1	7.69
Hispanic American	5	38.46
White/Caucasian	5	38.46
Multiple ethnicity/Other	0	0.0
Total	13	100

Table 4

Class standing of respondents

	Number	Percent
Freshman	0	0.00
Sophomore	0	0.00
Junior	1	7.69
Senior	6	46.15
Graduate student	4	30.77
Other- Just graduated	1	7.69
Other- No description given	1	7.69
Total	13	100

This pilot study did not track the number of assignment-specific training sessions each tutor had participated in, which may be a possible addition to future replications of the study. Some tutors had been employed for multiple semesters and may have undergone multiple training sessions.

Instruments

Participants were asked to respond to 20 statements (Appendix A) using a 7-point Likert scale. The self-efficacy statements were based on Bandura's (2006) self-efficacy scale and by Schmidt & Alexander's study of the self-efficacy of student writers (2012). Responses were collected in Qualtrics. Six of the statements also provided the option for text responses to collect qualitative information that may provide further explanation of the quantitative data. The survey allowed

participants to provide contact information if they were interested in a 15-30-minute follow-up video interview. Five interviews were completed and recorded within one month of initial distribution to participants. Interview questions are listed in Appendix B. Quantitative data analysis was completed using SPSS v26. The questionnaire was assessed for internal reliability using Cronbach's alpha (α).

Results and Discussion

This study examined the self-efficacy and transfer data from writing tutors following their participation in the assignment-specific tutor training. Recorded interviews with respondents who volunteered for this follow-up interview are included in the analysis. Results were categorized into three themes based on the research questions: Self-efficacy, professional development and transfer (which were split into separate tables for the analysis), and the instructor relationship with the tutor.

Self-efficacy data

Table 5 includes the five statements used to evaluate self-efficacy. Table 6 presents the data responses from these five statements, indicating a generally positive perception of self-efficacy.

Table 5

Statements used to evaluate self-efficacy

Q1. I am confident in my ability to continually improve as a writing tutor.
Q2. Sometimes I will not have the ability to help a tutee.
Q9. I am confident when switching from one genre to another over the course of multiple sessions in a day.

Q14. I am confident that the subject-specific training will improve my ability to effectively tutor students from any discipline.

Q17. My training has given me the ability to positively impact the attitude that a STEM student has about the importance of writing in the STEM disciplines.

Table 6

Responses to statements used to evaluate self-efficacy

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Q1	0	0	0	0	2	5	6
Q2	0	0	0	0	2	2	9
Q9	0	0	1	0	3	4	5
Q14	0	0	1	1	2	4	5
Q17	0	0	0	3	2	7	1

One tutor said that they had “never imagined working with engineers before,” and that the location of the engineering building meant that those in the engineering department rarely interacted with students in the area of campus where the writing center was located. After the assignment-specific training took place, however, this tutor stated that they felt more comfortable working with students from the engineering department and that engineering students visited the

writing center more often. Feeling more comfortable working with engineering students indicates an improvement in self-efficacy.

Transfer data

Table 7 includes the six statements used to evaluate transfer data. Table 8 presents the responses from these six statements. Q5, Q6, Q12, Q13, Q15, and Q18 were analyzed to determine the perception of the potential for personal and professional development by tutors within the study. Cronbach's Alpha=0.862 when analyzing the scale statistics for these questions, a value that confirms that scale reliability and relationship among this dataset.

Table 7

Statements used to evaluate transfer

Q5. I can effectively adapt the training I received to become a writing tutor to solve specific problems.
Q6. I can effectively adapt my writing tutor training to work with students from any discipline.
Q12. My time as a writing tutor will affect my professional development
Q13. My time as a writing tutor will affect my personal development
Q15. My time as a writing tutor will benefit my future career.
Q18. I have utilized my skills as a writing tutor outside of the peer tutoring context.

Table 8

Responses to questions used to evaluate professional development and transfer

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Q5	0	0	0	1	2	6	4
Q6	0	0	0	1	4	5	3
Q12	0	0	0	2	1	3	7
Q13	0	0	0	2	3	1	7
Q15	0	0	0	2	3	1	7
Q18	0	1	0	2	0	2	8

Tutors reported an overall positive effect on their interpersonal relationships and communication practices, similar to the data from the PWTARP study (Hughes, Gillespie, & Kail, 2010). There was one instance in this group of statements that a participant selected “disagree.” One participant disagreed with the statement “my tutor training has given me the ability to positively impact the attitude and practices that a STEM student has about their own writing.” All other responses were “neither agree nor disagree,” “somewhat agree,” “agree,” or “strongly agree.” Qualitative data from the questionnaire provided further explanation of the quantitative results. Participants stated that their experience had followed them outside the writing center, that they helped friends, family, and colleagues with writing, that they had become better listeners, and that they had used the training to communicate with peers outside the writing center. This feedback supports the statement that the transfer of learning taking place during training is

effective enough to carry over into the interpersonal skills and personal relationships of tutors as well.

Post-questionnaire interviews reinforced the initial findings. One tutor who had a background in engineering stated that while they had a background in the subject matter, it was still beneficial to receive the training since knowing information does not always mean that you can transfer the information. For this tutor, the assignment-specific training provided a foundation to facilitate that transfer of learning.

A third tutor observed that "despite having a similar background, you're always going to run into people who are writing papers about things you don't understand," and that not understanding material is a very different matter than writing being incoherent. These are just a few representative comments of the feedback that seemed to be especially focused on transfer of learning and working between genres, as well as finding common ground between tutor and tutee.

Professional development data

To examine this portion of the research question, Q12, Q13, Q15, Q18 were analyzed as a group to determine the perception of the potential for personal and professional development by tutors within the study. Cronbach's Alpha=0.953 when analyzing the scale statistics for these questions, a value that confirms that scale reliability and relationship among this dataset.

Table 9

Statements used to evaluate professional development

Q12. My time as a writing tutor will affect my professional development.

Q13. My time as a writing tutor will affect my personal development.

Q15. My time as a writing tutor will benefit my future career.

Q18. I have utilized my skills as a writing tutor outside of the peer tutoring context

Table 10

Professional development

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Q12	0	0	0	2	1	3	7
Q13	0	0	0	2	3	1	7
Q15	0	0	0	2	3	1	7
Q18	0	1	0	2	0	2	8

Tutor awareness of professional development can be found within the responses to Q12. These responses provided insight as to how tutors view their position and its effect on their career. One tutor stated “I plan to be in a service oriented profession that requires patience and strong communication, and the ability to discuss STEM topics at different levels of language and specialty ability,” while another answered that “effective communication is a en[sic] essential skill in many fields… by spending time in trainings and tutoring sessions, I am also investing in my professional development.” Additionally, one tutor mentioned that they had “learned to work with different groups of people and was able to explain writing concepts to them,” as well as utilizing “the right approach to better understand their engineering projects.”

Professional development as a writing tutor is also considered within the open responses. Self-efficacy of writing tutors in regards to STEM students can be analyzed within the answers to the statement “My tutor training has given me the ability to positively impact the attitude and practices that a STEM student has about their own writing.” After the assignment-specific tutor training session, one tutor stated that “several students were appreciative that I was able to guide them to find their own answers” and aiding the STEM students’ self-efficacy. Another tutor indicated that the training allowed them to “bridge the gap” and connect the students’ material to writing within their field.

The statement “My time as a writing tutor will benefit my future career” yielded similar results. Multiple tutors left comments such as “reading studies objectively, educating others, and providing motivation for improvement will allow me to grow as a professional”, “as a nursing student, I think it’s important to have good writing skills in the field”, and “the patience I develop from tutoring students…will help me cooperate better with others in the workplace”.

Responses concerning the effect on personal development provided examples of writing tutors’ insight into how their time as a tutor may affect their life outside of the writing center. “My time as a writing tutor will affect my personal development” is one statement that provides a link between assignment-specific tutor training and personal development. One respondent stated that they had “become better at understanding the students (they) help”. Others noted that “taking on this project was challenging and has made me less afraid of working with unfamiliar materials,” that it prompted “more motivation towards self education,” and elicited improved “interpersonal skills and ability to discuss and explain topics to others.”

These responses to the question of personal and professional development indicate the potential that utilizing assignment-specific training program within the writing center can have for the

development of peer writing tutors, as self-reported through the text entry option of these two questionnaire statements. The potential for self-efficacy growth in professional and personal contexts could be invaluable to the growth of writing tutors' adaptability to workplace communication, a skill that will likely be useful as industry enters the Fourth Industrial Revolution (da Silva, Kovaleski, & Pagani, 2019). The ability to adapt to a variety of communication styles and utilize transfer of learning within the workplace, reinforced with assignment-specific training, would be a beneficial skill for any writing tutor, whether they are entering the workforce or remaining as a tutor.

Tutor and STEM-instructor relationship

Referred to by Harvey Kail (1983) as the "teacher-student-tutor" (p. 596) relationship, tutors are pedagogically linked to the instructors of the students who visit the writing center. Tutors are often given guidelines by the writing center for how they should best work with students to avoid taking the place of the teacher. However, situations can sometimes arise that make this balance difficult to attain. Q3, Q7, Q8, Q10, Q11, Q16, Q17, and Q19 were analyzed as a group to determine the perception of that balance by tutors within the study. Cronbach's Alpha=0.744 when analyzing the scale statistics for these questions, a value that confirms that scale reliability and relationship among this dataset.

Table 11

Statements used to evaluate tutor-STEM instructor relationship

Q3. I can effectively tutor students who are in STEM fields.

Q7. I can effectively adapt the training I received to become a writing tutor to solve specific problems.

Q10. I have been adequately trained as a tutor to handle any genre or writing conventions.

Q11.There is a gap between what the instructor wants from a student and what I tell them.

Q16. My time as a writing tutor will affect my personal development.

Q17. My time as a writing tutor will benefit my future career.

Q19. My training has given me the ability to positively impact the attitude that a STEM student has about the importance of writing in STEM disciplines.

Table 12

Tutor-STEM instructor relationship

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree	Missing
Q3	0	0	0	1	6	3	1	2
Q7	0	0	0	1	6	3	3	0
Q8	0	0	0	2	1	5	5	0
Q10	0	0	0	4	1	5	3	0
Q11	0	1	1	2	1	2	6	0
Q16	0	0	1	3	1	4	4	0

Q17	0	0	0	3	2	7	1	0
Q19	1	0	1	5	5	0	1	0

This dataset examines the relationship between tutor confidence and self-efficacy in their tutoring ability based on training and knowledge and in their perception of value by STEM instructors. This data was collected after tutors had participated in the assignment-specific training and does not take into account the possible difference in confidence and self-efficacy prior to this training. Tutors' confidence in their ability to work with STEM students is also analyzed within this dataset to examine the point of contact between STEM instructors and tutors.

Personal views of the tutors concerning their own assessment of their ability to work with STEM students show positive results. 90.0% of the participants agreed to some degree (somewhat agree, agree, or strongly agree) in Q3 that they have sufficient knowledge to tutor STEM writing effectively. However, 54.5% of participants chose somewhat agree, indicating that while the majority of tutors feel that they have sufficient knowledge, they do not hold a strong belief that they are able to work effectively with STEM students. Evidence of a disparity can also be found within interviews that were conducted. As mentioned previously, one participant stated that they had "never imagined working with engineers before" and had not previously felt as though they had been sufficiently prepared to work with that group of students. After the training, they felt confident working with engineering students who came into the writing center, indicating an increase in self-efficacy.

When asked in Q8 whether they had the ability to have a positive impact on how a STEM student thinks about writing, 77% of participants either agreed or strongly agreed that they could

provide a positive impact on how a STEM student thinks about writing. Additionally, Q16 and Q17 prompted them to consider whether their tutor training gave them the ability to positively impact the attitude and practices that a STEM student has about their own writing and the importance of writing in the STEM disciplines, respectively. 61.6% of participants stated that they agreed or strongly agreed that the training had given them the ability to positively impact the attitude and practices that a STEM student has about their own writing, and 61.5% of participants agreed or strongly agreed that the training had given them the ability to positively impact the attitude that a STEM student has about the importance of writing in the STEM disciplines. As one participant stated in a text entry for Q16, they feel that the training "has shown students how helpful tutoring is" and to "approach writing with a positive attitude."

The indication of the presence of self-efficacy within the participants as a group should then be considered in light of their perception of their value by the STEM instructors and within the institution. In Q10, 61.6% of participants agreed or strongly agreed that they feel valued by the instructors at their institution. When asked if they felt valued by the instructor(s) involved in the training in Q11, 61.6% of participants agreed or strongly agreed that they felt valued by the instructor(s) involved in the training. Text responses to Q11 provide some insight into the training experience and how it impacted their positive perception of instructor value within the training. Some examples include:

> "(Instructor) has made it clear that he respects and appreciates the time we as tutors put into helping (their) students…"
>
> "The instructors gave us all the information we asked for and (were) very patient in answering all our questions."

"We had time to discuss our questions and concerns…"

While many of the statements conveyed feeling valued by the instructors involved in the study, others stated:

"I don't know"

"Since I really don't see the professors of the students who come to the writing center for help, I can't know for sure how they feel about me."

There may be a disconnect for some participants in perception of instructor value in their tutoring and what the writing center provides for their students. This may, in turn, affect how STEM students value the writing center and whether the tutors are capable of helping them with something of value. Additional data will provide more information to potentially discern a more exact perception of value of the writing center by STEM students and faculty.

Implications for Future Research

There are several limitations to this study that should be addressed when it is replicated. The small sample size resulted in a small N of 13; as a result, testing for statistical significance using correlation could not be completed. Any future iterations should contain a larger N to ensure that statistical testing can confirm the conclusions made by the descriptive data of this study. In addition, looking at other populations including institutions that have large numbers of students who speak English as an additional language could be beneficial.

The feedback that participants provided concerning their interactions with the professors involved in the research provided a good deal of information, but there are still many gaps to fill

in this area. Referring back to the relationship that Kail (1983) had discussed, the relationship between students, their instructors, and writing tutors may be difficult to navigate. Further research needs to be completed to further examine the working relationship between tutors and instructors to explore the responses from participants who responded that they did not feel valued by the instructor, with the purpose of improving the relationship between writing tutors and STEM instructors.

Instructor buy-in is a crucial aspect of the assignment-specific training method. If the instructor does not see the inherent value of better student writing, their students will not have motivation or incentive to improve their writing. The writing center director and the instructor responsible for training should, ideally, be united in the project so that both tutors and STEM students can see the importance placed on improved student writing by the STEM instructor. Instructors should show their support by emphasizing the need for better writing within their classes and the value that assignment-specific training brings to their writing ability.

Transfer of learning for writing tutors could be a potentially valuable skill in the workplace. While the data within this study indicated that tutors noticed their ability to transfer learning from the writing center to other areas of their life, further study could provide investigate transfer of learning from the writing center to the workplace that is aided by the assignment-specific training method.

The results of this literature review and pilot study point to several areas of future research, the first of which is the importance of fostering self-efficacy in writing tutors. Tutors who took part in this study reported greater confidence in their ability to successfully help STEM students to improve their writing. Based upon the principles of transfer of learning, a tutor who has self-efficacy will be better equipped to help a student from any genre than a tutor who lacks self-

efficacy. Currently there is not a system of best practices for tutor self-efficacy development; further research into this training method may provide evidence for continued practice as a method of developing self-efficacy development in writing tutors.

The perception of STEM faculty by writing tutors also needs to be investigated as a possible method of improving the quality of writing of STEM students. Results of this study suggest that there may be a perceived imbalance of power within a tutoring session on the part of the tutor. This perception could lead to sessions that are lacking and that ultimately result in a lack of self-efficacy and confidence on the part of the tutor, as well as a lackluster session for the STEM student. Involving STEM faculty in the tutor training program seems to be beneficial to the self-efficacy of writing tutors. This interdisciplinary collaboration can foster writing improvement in the STEM fields as well as potentially benefit tutors by acting as professional tutor development.

Finally, further development should be done to develop tutor training programs that will provide them with a solid foundational knowledge of genre. Providing tutors with preliminary knowledge of genre conventions across disciplinary boundaries will enable them to best utilize their skills when working with a student.

This study begins to contribute to the field information about the self-efficacy, transfer and professional development of writing tutors, and the relationship between the STEM instructors and the writing center tutors following tutor participation in interdisciplinary assignment-specific tutor training. Providing the conditions to allow for the ideal writing center session will provide added value to writing centers, individual departments, universities as a whole, and the writing center’s place within the structure of the learning community.

References

Babcock, R. D., & Thonus, T. (2012, 2018). *Researching the writing center: Towards an evidence-based practice*. New York: Peter Lang International Academic Publishers.

Bandura, A. (2006). Guide for constructing self-efficacy scales. In F. Pajares & T. Urdan (Eds.). *Self-efficacy beliefs of adolescents*, (pp. 307-337). Greenwich, CT: Information Age Publishing.

Berghmans, I., Neckebroke, F., Dochy, P., & Struyven, K. (2013). A typology of approaches to peer tutoring. Unraveling peer tutors' behavioural strategies. *European Journal of Psychology of Education, 28*(3), 703-723.

Bruffee, K. (2008). What being a writing peer tutor can do for you. *Writing Center Journal, 28*(2), 5-10.

Carino, P. (2003). Power and authority in peer tutoring. In Pemberton, M. & Kinkead, J. (Eds.), *Center Will Hold* (pp. 96-113). Logan, Utah: University Press of Colorado. doi:10.2307/j.ctt46nxnq.9

Comer, D.K. (2017). *Writing in transit*. Southlake, TX: Fountainhead Press.

da Silva, V.L., Kovaleski, J.L., & Pagani, R.N. (2019). Technology transfer and human capital in the Industrial 4.0 scenario: A theoretical study. *Future Studies Research Journal11*(1), 102-122.

DeFeo, D.J., & Caparas, F. (2014). Tutoring as transformative work: A phenomenological case study of tutors' experiences. *Journal of College Reading and Learning, 44*(2), 141-163.

Devet, B. (2015). The writing center and transfer of learning: A primer for directors. *Writing Center Journal, 35*(1), 119-151.

Driscoll, D. L. (2015). Building connections and transferring knowledge: The benefits of a peer writing course beyond the writing center. *Writing Center Journal, 35*(1), 153-181.

Driscoll, D. L., & Perdue, S. W. (2012). Theory, lore, and more: An analysis of RAD research in the Writing Center Journal, 1980-2009. *Writing Center Journal, 32*(2), 11–39.

Driscoll, D. L., & Wells, J. (2012). Beyond knowledge and skills: Writing transfer and the role of student dispositions. *Composition Forum*, 26.

Enochs, L.G., & Riggs, I.M. (1990). Further development of an elementary science teaching efficacy belief instrument: A preservice elementary scale. *School Science and Mathematics, 90*, 695-706.

Enochs, L.G., Smith, P.L., & Huinker, D. (2000). Establishing factorial validity of the Mathematics Teaching Efficacy Beliefs Instrument. *School Science and Mathematics, 100*(4), 194-202.

Gordon, L. (2014). Beyond generalist vs. specialist: Making connections between genre theory and writing center pedagogy. *Praxis: A Writing Center Journal, 11*(2), 1-5.

Graham, S., Harris, K.R., Fink, B., & MacArthur, C.A. (2001). Teacher efficacy in writing: A construct validation with primary grade teachers. *Scientific Studies of Reading, 5*(2), 177-202.

Haider, M., & Yasmin, A. (2015). 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, 1*(3), 170-173.

Hughes, B., Gillespie, P., & Kail, H. (2010). What they take with them: Findings from the peer writing tutor alumni research project. *Writing Center Journal, 30*(2), 12-46.

Kail, H. (1983). Collaborative learning in context: The problem with peer tutoring. *College English, 45*(6), 594-599.

Kain, D., & Wardle, E. (2005). Building Context: Using Activity Theory to Teach About Genre in Multi-Major Professional Communication Courses. *Technical Communication Quarterly, 14*(2), 113–139.

Kohn, L. (2014). Can they tutor science? Using faculty input, genre, and WAC-WID to introduce tutors to scientific realities. *Composition Forum,* 29.

Lotter, C., Thompson, S., Dickenson, T., Smiley, W., Blue, G., & Rea, M. (2016). The impact of a practice-teaching professional development model on teachers' inquiry instruction and inquiry efficacy beliefs. *International Journal of Science and Mathematics Education,* 16, 255-273.

Mackiewicz, J., & Thompson, I. K. (2015). *Talk about writing: the tutoring strategies of experienced writing center tutors.* Routledge.

Nordlof, J. (2014). Vygotsky, scaffolding, and the role of theory in writing center work. *Writing Center Journal, 34*(1), 45-64.

Perdue, S. W., & Driscoll, D. L. (2017). Context matters: Centering writing center administrators' institutional status and scholarly identity. *Writing Center Journal,* 185-214.

Powell, R., & Hixson-Bowles, K. (2018). Too confident or not confident enough?: A quantitative snapshot of writing tutors' writing and tutoring self-efficacies. *Praxis, 16*(1), 32-62.

Raign, K. (2017). Learning about something means becoming wiser: The Platonic dialogue as a paradigmatic model for writing center practice. *Praxis*, 14(3), 32-40.

Ryan, L., & Zimmerelli, L. (2016). The Bedford guide for writing tutors. Boston: Bedford/St. Martins.

Schmidt, K., & Alexander, J. (2012). The empirical development of an instrument to measure writerly self-efficacy in writing centers. *Journal of Writing Assessment, 5*(1), 1-10.

Turner, M. (2006). Writing centers: Being proactive in the education crisis. *Clearing House: A Journal of Educational Strategies, Issues and Ideas,80*(2), 45-47.

X, & Y. (2018). Collaborating with writing centers on interdisciplinary peer tutor training to improve writing support for engineering students. *IEEE Transactions on Professional Communication, 61*(2), 206-220.

Appendices

Appendix A. Measuring confidence and self-efficacy following assignment-specific tutor training

Directed project questions, 7-point Likert scale, option to provide contact information to be contacted for an interview will be at the end of the questionnaire

*- Only asked of students who stated that they had taken part in the assignment-specific training.

1. I am confident in my ability to continually improve as a writing tutor.

2. Sometimes I will not have the ability to help a tutee.

3. I can effectively tutor students who are in STEM fields.

4. As a writing tutor, I have the ability to help a student become a better writer.

5. I have sufficient knowledge to tutor STEM writing effectively.

6. I have the ability to positively impact a student's writing.

7. I can effectively adapt the training I received to become a writing tutor to solve specific problems.

8. Sometimes I feel unsure about how to help a student that I am tutoring.

9. I can effectively adapt my writing tutor training to work with students from any discipline.

10. I have been adequately trained as a tutor to handle any genre or writing conventions.

11. There is a gap between what the instructor wants from a student and what I tell them.

12. I can provide a positive impact on how a STEM student thinks about writing.

13. I am confident when switching from one genre to another over the course of multiple sessions in a day.

14. I am valued as a tutor by the instructors at this institution.

14a.* I am valued as a tutor by the instructor(s) involved in this training.

Please explain your answer_____

15. My time as a writing tutor will affect my professional development.

Please explain your answer_____

16. My time as a writing tutor will affect my personal development.

Please explain your answer_____

16a.* I am confident that this training will improve my ability to effectively tutor students from any discipline.

17. My time as a writing tutor will benefit my future career.

Please explain your answer_____

18. My tutor training has given me the ability to positively impact the attitude and practices that a STEM student has about their own writing.

Please explain_____

19. My training has given me the ability to positively impact the attitude that a STEM student has about the importance of writing in STEM disciplines.

20. I have utilized my skills as a writing tutor outside of the peer tutoring context.

Please explain _____

Are you available to participate in a 15-30 minute follow-up interview that will be recorded using videoconferencing software? Yes/No

(If participant answers yes, participant will submit their phone number or email to be used for a follow-up.)

Appendix B. Interview questions for voluntary post-questionnaire interviews:

1. How has the training affected your perception of yourself as a tutor?

2. Do you think that this training has changed the way you approach STEM students in the writing center?

    2a. If yes, describe how it has improved your interaction.

    2b. If no, describe how it has not improved your interaction.

3. Was there a change in your perception of your role in the writing center?

4. Describe your role as a writing tutor within the university. Does your position add value to the university as an institution? Explain.

5. How much of a difference do you think you were able to make in the writing of the students who came in for this study?

6. How might this training affect you now that it is complete?