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Graduate Student Completion and Comprehension of Assigned Readings: A SoTL Project

ABSTRACT

This project examined the effectiveness of two reading strategies for graduate speech-language pathology students: peer-guided questioning using social annotation and individual reading with general instructor guidance. Thirty-six students were randomly assigned to one of the strategies, alternating for four assignments. Comprehension quizzes and self-reported reading completion were assessed. Additionally, student attitudes toward assigned readings were explored pre- and post-project, along with barriers and facilitators to reading comprehension. Results showed no significant difference between the strategies in improving comprehension or the amount of reading completed. Reported barriers to reading included time constraints and complex texts, while suggested facilitators involved pre-reading preparation and vocabulary instruction. Although neither strategy proved superior, the study highlights potential instructor-led approaches to enhance student engagement and comprehension with assigned readings, such as addressing barriers and implementing facilitators. Reflection on unexamined assumptions for this project was presented.

KEYWORDS

literacy, college reading, higher education, graduate education, speech-language pathology

INTRODUCTION

This Scholarship of Teaching and Learning (SoTL) project is rooted in the authors' observation that many students struggle with completing assigned readings and demonstrating comprehension. This difficulty is understandable, given that research indicates college students often struggle with reading comprehension, which can negatively affect their academic performance (Clinton-Lisell et al. 2022; Sands and Goodman 2018). Concerns about student reading habits and comprehension in higher education have been prevalent (Doolittle et al. 2005), compounded by growing disparities in academic preparation and the decline of long-form reading (Baron and Mangen 2021). Additionally, many students approach academic texts superficially, hindering their ability to make connections and engage critically (King 1997).

These challenges impact students' deeper thinking skills. The literature defines deep reading as an active process where students think critically, make connections, and build their understanding (Kintsch 1998; Kintsch and van Dijk 1978; de la Peña Álvarez and Luque-Rojaset al. 2021; Roberts and Roberts 2008). To address these challenges and foster deep reading, the authors set out to evaluate pedagogical strategies aimed at improving reading comprehension.

Reading compliance in higher education is also declining. Burchfield and Sappington (2000) found only a third of students complete all readings, attributing to the rise of online summaries. Gorzycki et al. (2020) revealed a disconnect between students' recognition of the importance of reading and their actual behavior, particularly among those with lower reading proficiency.

Many students, especially those with lower reading proficiency, do not view reading as crucial for academic success, despite knowing its value. Oliver (2022) suggests that linking assigned readings to discussions and emphasizing their relevance to future careers can improve reading compliance.

The trends described above underscore the need for innovative pedagogical approaches that foster deep reading and critical thinking. Explicit instruction in reading comprehension strategies and guided activities, like use of social annotation during readings (Cheung and Slavin 2013; K.L.E. 2021) can promote deeper understanding (El-Koumy 1996).

Social annotation as a context for reading

Social annotation tools facilitate peer discussions around shared texts (Morales et al. 2022). Learners can annotate documents, highlighting passages and adding comments (Gao 2013). This encourages deeper understanding, critical engagement, and more questions from students during online discussions (Choi, Land, and Turgeon 2005; Wolfe 2008). Morales et al. (2022) found that social annotation, particularly using platforms like *Hypothes.is* (Hypothes.is, n.d.), fosters productive online discourse and collaborative learning. While research on social annotation in higher education is ongoing, current studies show positive educational outcomes in higher education contexts (Novak, Razzouk, and Johnson 2012), particularly when learners are assigned participant roles (Zhu et al. 2020). Social annotation has potential to enhance reading comprehension across diverse learners by promoting active engagement, critical thinking, and collaborative knowledge construction.

Guided peer questioning

Elaborative interrogation, a technique prompting students to explain facts, has proven effective in enhancing learning because it integrates new information with prior knowledge (Dunlosky et al. 2013). Its benefits span various learning conditions and student abilities, although prior knowledge influences its effectiveness, with high-knowledge learners gaining the most (Dunlosky et al. 2013; Woloshyn, Pressley, and Schneider 2023). Similarly, self-explanation, where students explain concepts to themselves, improves comprehension and retention (Nakamoto et al. 2023). Wang et al. (2023) demonstrated that self-explanation promoted deeper processing and understanding of learning outcomes, even with a reported increase in cognitive load.

Guided peer questioning extends these strategies, utilizing social interaction to deepen learning. It actively engages students to generate and respond to thought-provoking questions, fostering critical thinking and collaboration (Rashwan et al. 2021). By articulating viewpoints and engaging in dialogue, students deepen understanding and construct knowledge (McKinley 2015; Vygotsky 1978). This approach enhances academic performance, particularly in complex fields (Baron 2017). Through self-explanation and inference, students can connect new information to prior knowledge and foster self-regulated learning (Rashwan et al. 2021). Further, it acts as a scaffolding technique, prompting students to generate inferences and develop a critical epistemology (King 1997). This empowers students to move beyond literal comprehension, fostering greater understanding of academic materials (Wiles, Allen, and Butler 2016). While the impact of guided peer questioning on critical thinking and metacognition has been examined in higher education (Meibodi et al. 2013), further research is needed to explore its potential for fostering deeper understanding and critical engagement with texts in this context.

This project sought to determine the relative effectiveness of a peer-guided questioning strategy using social annotation during reading versus individual reading with general guidance from the instructor regarding the purpose of the reading. Secondarily, the project aimed to determine how to implement the more effective reading strategy into a graduate speech-language pathology course.

A tertiary aim was to explore students' disposition toward assigned course readings, including the frequency with which students completed assigned readings. The research questions included:

1. Does peer-guided questioning during reading or general instructor guidance for reading lead to better literal comprehension of content from assigned readings?
2. Does peer-guided questioning during reading or general instructor guidance for reading lead to better inference (deeper comprehension) from assigned readings?
3. Does collaborative reading (peer-guided questioning) result in larger amounts of assigned readings completed compared to individual reading?
4. Do students' dispositions toward completing assigned readings change after having participated in both collaborative (peer-guided questioning) and individual reading?

While the project initially aimed to implement the most effective reading strategy in the classroom, neither strategy proved superior. Therefore, the researchers shifted focus to explore student perceptions of the reading tasks, examining their effectiveness, benefits, and challenges. This shift resulted in a two-phase project: first, comparing peer-guided questioning to individual reading with instructor guidance; and second, exploring student perceptions of the assigned reading activities. Ethical approval from the Institutional Review Board (IRB) was obtained to complete this study, including an amendment when research methods were updated, as described in the methods below.

METHODS

This study employed a mixed method, quasi-experimental, closed cohort design with first-year graduate speech-language pathology students. One group utilized a peer-guided questioning strategy with social annotation during reading, while the other group employed individual reading with general instructor guidance. Their comprehension and reading behaviors were compared across four assigned readings.

Participants and educational context

Thirty-six first-year graduate speech-language pathology students were invited to participate in this project as part of their a*ssessment and treatment of dysphagia* course (dysphagia is disordered chewing/swallowing). All students were female and the mean age was 22.08 years with a range of 21–28 years old. The participants were beginning their third semester of a six-semester program, having completed courses in child language disorders, aphasia, voice, motor speech, and speech sound disorders. Given the type of coursework completed prior, students had basic anatomy and physiology background for understanding basic aspects of swallowing and swallowing disorders but were not expected to have any other relevant information about swallow function.

Phase one

Measures

Student disposition toward reading comprehension. To determine whether students demonstrated traits of a "makes sense epistemology" or a "critical epistemology" (Perkins, Farady, and Bushey 1991), students were asked to anonymously answer the following questions: "When you complete an assigned reading for your course, what is your goal above and beyond simple completion of the assignment?" (goal disposition) and "What purpose do you think assigned readings serve in this course?" (purpose disposition). This was completed before the project and directly after the project.

Completion of assigned readings. To determine the frequency with which students completed assigned readings (reading compliance), students anonymously self-reported whether they completed the entire reading, most of the reading, some of the reading, or none of the reading.

Literal comprehension. There are various ways to measure reading comprehension ranging from standardized assessments to more informal measures. Answering questions about the content of a reading is a proven method for assessing reading comprehension (Fuchs, Fuchs, and Maxwell 1988). To measure students' literal comprehension of the assigned reading, students completed a 10-item multiple choice quiz based on content from the assigned reading.

Two of the study's authors verified that information on the quizzes came directly from the reading. To avoid any unfair advantages to some students, as a result of which strategy was employed during reading, the activity was not completed for a grade. Quizzes were scored as one point per correct response. The quiz items are added as a supplement to this manuscript.

Inference. To measure students' deeper comprehension of the assigned reading, students were asked to respond to four open-ended questions which required the student to provide explanations about the content not explicitly stated in the reading or otherwise integrate concepts that went beyond what was explicitly presented in the reading. For example, in an assigned reading on the role of the tongue in moving food from the front to the back of the mouth during swallowing, an open-ended question might be, "Given what you learned regarding the tongue's role in swallowing, explain what would happen if the left part of the tongue was surgically removed due to oral cancer." In this example, the reading addressed normal tongue function during parts of the swallow but not abnormal (i.e., parts of tongue being absent) aspects of lingual function. As such, the reader would be required to apply what was learned about normal function to an unaddressed topic (requiring application of new knowledge). Two of the study's authors assured that the questions asked on the quizzes required application of material and that the content was not explicitly outlined in the reading. Responses were scored as two points per question, allowing for partial credit. The quiz items are added as a supplement to this manuscript.

Reading strategy

Individual reading with general instructional guidance. This reading strategy required students to complete the assigned reading individually using a general set of guiding directions. For example, students were asked to complete a reading on the role of the tongue in swallowing, paying particular attention to the muscles required to move the tongue posteriorly. General instructional guidance was developed separately from any quizzes, so as not to "teach to the test."

Peer-guided questioning with social annotation. This reading strategy required students to complete the assigned reading in a dyad, asynchronously, using the social annotation tool *Hypothes.is* (Hypothes.is, n.d.). Students were instructed to assume the role of questioner or responder. The questioner's role was to ask probing questions that elicited explanations and inferences about the material. The responder had to provide an answer to the question that was complex and thoughtful. For example, if the dyad completed a reading assignment on the neurological control of swallow initiation, the questioner might ask, "How is neurological control of swallow initiation similar or dissimilar to control of voicing?" A complex and thoughtful response would include consideration of whether there are common neurological underpinnings of swallow initiation and production of voice. This would not have been covered in the reading assignment and would require the student to make an inference and/or connection with prior knowledge about voice production. Appendix A provides the reference materials provided to the students outlining how to ask and answer questions during the social annotation tasks.

Procedures

1. Before the project, each participating student anonymously completed the *student disposition toward reading* question. Students had the option to turn in papers without responding to the question if they chose not to participate.
2. Two sections of *SLP 614: assessment and treatment of dysphagia* participated in this project. Both sections had identical reading assignments, course topics, course learning activities, and tests/quizzes. Each section was taught by a member of the university's department of speech-language pathology. Four rounds of data collection occurred. In the first round, one section completed the reading assignment using the individual reading strategy and the other section completed the reading using the peer-guided questioning strategy in a dyad. For the next round, each section switched the strategy assigned to complete the new reading, effectively alternating the assigned strategy across four assigned readings. All assigned readings were sourced from the same textbook and did not vary in style.
3. After having the opportunity to complete a reading, each student reported the amount read along with the literal comprehension and inference comprehension quizzes.
4. Once one round of assigned reading and quizzes was accomplished, round two commenced. Each section got a new assigned reading and was asked to use the other reading strategy. The reading strategy assigned to each section varied each round, for a total of four rounds (each section got two opportunities with each reading strategy).
5. To increase the validity of the analysis, two investigators randomly reviewed 20% of the students' social annotation sessions to ensure method fidelity in both asking and answering questions about the readings during the collaborative reading assignments. This included four reading dyads from each course section (each course section had nine dyads). Of the 20% checked, 75% fully met our criteria for following directions in asking and answering questions appropriately. The criteria included that at least three of five required questions/responses fully met the requirements for asking/answering questions. Criteria for asking/answering questions included that the question required inference. Responses required three parts: information that answered the questions, why or why not it was true, and some type of connection to something the reader would likely already know or was familiar with (prior knowledge).
6. After students completed all four rounds of assignments and answered the final *student disposition toward reading* questions, one investigator formally presented the comparison of reading strategies data as well as the frequency/completeness of reading data to the participating students during their class.

Phase two

Measures

An anonymous survey was created and distributed to the student participants via *Qualtrics™* web-based survey platform. Please see Appendix B for the survey items. The purpose of the survey was to discern participating students' perceptions of the reading tasks assigned for the project, including barriers to completing and understanding assigned readings. Results were analyzed using descriptive statistics and thematic analysis. The first author reviewed the student participants' responses to the open-ended survey items and listed concepts/reasons provided in response to the questions. These were tallied across all participants. The second author checked the accuracy of the initial listing and frequency counts. There were no inaccuracies noted during this review.

Procedures

1. During the completion of phase one, effectiveness data were continually analyzed, and it became clear that neither reading strategy appeared to facilitate comprehension and interpretation better than the other. Rather than, then, attempting to explore how to best implement a reading strategy that did not appear to be any more effective than another (the initial aim of the project), the team pivoted to explore student perceptions regarding the usefulness of assigned readings, including barriers to understanding and completing the readings. To accomplish this, the survey described above (Appendix B) was developed.
2. After phase one was complete, the student participants were emailed a link to anonymously complete the survey.

Data analysis for phase one

Data analysis included both inferential statistics and qualitative analyses. Although the N for this study is relatively small, inferential statistics were used as part of the data analysis methods. Hopkin, Hoyle, and Gottfredson (2015) described several use cases for inferential statistics in small N studies. Inferential statistics can be used to evaluate hypotheses to cautiously make inferences. In addition, inferential statistics, even with a small N, can provide effect sizes as well as allowing the study's results to be part of larger meta-analyses in the future. Use of inferential statistics within a small N study can help generate further hypotheses for future studies even with lower statistical power. Last, de Winter (2013) ran t-test simulations with samples as small as two participants and reported acceptable results in many of the cases when there was equal variance between groups. Therefore, a small sample size, as is often a reality when engaging in SoTL in one's own classroom, does not preclude the use of inferential statistics in analyzing data.

1. Data from all four rounds were analyzed. Analysis included a comparison of the scores for literal comprehension and inference on both quizzes by reading strategy. A *t-test* was used to determine whether there was a statistically significant difference between the groups based on the reading strategy assigned. Each round was analyzed separately to look for any discernable pattern of repeated better performance based on the reading strategy assigned. Next, combined scores from all quizzes were compared by reading strategy groups using a t-test. Since all subjects experienced both levels of the independent variable (reading strategy), the goal for this analysis was to increase statistical power to look for smaller effects not detectable with the smaller *N* in the individual quiz analyses using a between-group comparison.
2. The data reporting the amount students read were analyzed using a series of t-tests to determine whether there was a statistically significant difference between the groups based on the reading strategy assigned.
3. Student dispositions toward reading were analyzed using the written texts from the *student disposition toward reading* questions collected both pre- and post-project. Analysis of the written texts was accomplished by two investigators' collective reading of student responses and using an a priori coding scheme that labeled text segments as "makes sense epistemology" or "critical epistemology." Both the investigators read and discussed the student responses together and agreed on the assigned label. In cases where the response did not fit the coding scheme or it was not clear what the student meant, no label was assigned, and these instances were not included in the analysis.

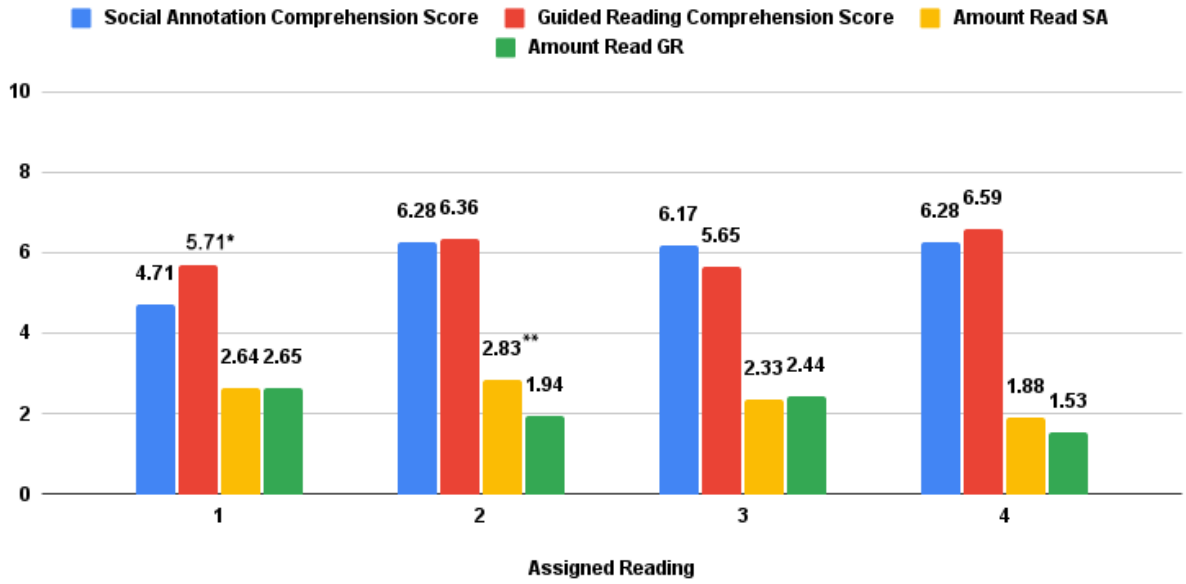
Data analysis for phase two

Post-hoc linear regressions were run to explore whether the amount students reported reading predicted their score on the literal comprehension and inference comprehension quizzes.

RESULTS

Figure 1 displays a summary of average scores on the literal comprehension quizzes (out of 10 possible points) by reading strategy group separated by assignment number. This figure also displays the amount reported read (out of four possible points) for each assignment by reading strategy group. Figure 2 displays a summary of average scores on inference comprehension quizzes (out of eight possible points) by reading strategy group separated by assignment number and includes reported amounts read (out of four possible points) as well.

Figure 1. Literal comprehension and amount read by assigned reading



Note: In Figure 1 above, *statistically significant ($p<.05$), amount read for each assigned reading was on a 4-point scale: 1=nothing read, 2=some read, 3=most read, 4=all read); Comprehension Quiz scores were out of 10.

Figure 2. Inference score and amount read by assigned reading

Note: In Figure 2 above, amount read for each assigned reading was on a 4-point scale: 1=nothing read, 2=some read, 3=most read, 4=all read); Inference Quiz scores were out of 8.

Literal comprehension

To determine whether social annotation or general guided reading strategies led to better literal comprehension of assigned readings, results of literal comprehension quizzes were compared between reading strategy groups using t-tests. Table 1 displays the means and standard deviations for both groups across all three measures: literal comprehension (out of 10 points), inference comprehension (out of eight points), and frequency of reading (out of four points).

Table 1. Literal comprehension, inference, and amount read measures

	Quiz 1 comp*	**Quiz 2 comp**	**Quiz 3 comp**	**Quiz 4 comp**
Social annotation	4.71 (N=14, SD=1.59; Cohen's d=1.49)	6.28 (N=18, SD=1.87)	6.17 (N=18, SD=1.94)	6.28 (N=18; SD=1.44)
Guided reading	5.71 (N=17, SD=1.4)	6.35 (N=17, SD=1.53)	5.65 (N=17, SD=1.57)	6.59 (N=17, SD=1.66)
	Quiz 1 inference	**Quiz 2 inference**	**Quiz 3 inference**	**Quiz 4 inference**
Social annotation	4.29 (N=14, SD=2.05)	2.78 (N=18, SD=2.8)	2.0 (N=18, SD=1.78)	4.44 (N=18, SD=2.12)
Guided reading	3.53 (N=17, SD=1.32)	2.59 (N=17, SD=1.8)	2.12 (N=17, SD=1.53)	3.71 (N=17, SD=2.14)
	Amount read 1	**Amount read 2**	**Amount read 3**	**Amount read 4**
Social annotation	2.64 (N=14, SD=.633)	2.83 (N=18, SD=.786)	2.33 (N=18, SD=.485)	1.88 (N=16, SD=1.02)

Guided reading	2.65 (N=17, SD=.862)	1.94 (N=17, SD=.748)	2.44(N=16, SD=1.03)	1.53 (N=17, SD=.624)

Note: *statistically significant (p<.05); "Read" = amount read for each assignment (there were four assignments, 1=nothing read, 2=some read, 3=most read, 4=all read); Comprehension Quiz scores were out of 10; Inference Quiz scores were out of eight.

Literal comprehension quiz 1

For quiz one, 14 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 10 possible points) was 4.71 (SD=1.59) for social annotation and 5.71 (SD=1.4) for general guided reading. Independent t-tests revealed a significant difference between the two reading strategy groups (t=-1.844, df=29, p=.03, Cohen's *d*=1.490). The guided reading group scored significantly higher on the literal comprehension test and the effect size (Cohen's *d*) was large.

Literal comprehension quiz 2

For quiz two, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 10 possible points) was 6.28 (SD=1.87) for social annotation and 6.35 (SD=1.53) for general guided reading. Independent t-test revealed no significant difference between the two reading strategy groups (t=-.129, df=33, p>.05).

Literal comprehension quiz 3

For quiz three, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 10 possible points) was 6.17 (SD=1.94) for social annotation and 5.65 (SD=1.57) for general guided reading. Independent t-test revealed no significant difference between the two reading strategy groups (t=.864, df=33, p>.05).

Literal comprehension quiz 4

For quiz four, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 10 possible points) was 6.28 (SD=1.44) for social annotation and 6.59 (SD=1.66) for general guided reading. Independent t-test revealed no significant difference between the two reading strategy groups (t=-.591, df=33, p>.05).

All literal comprehension quizzes combined

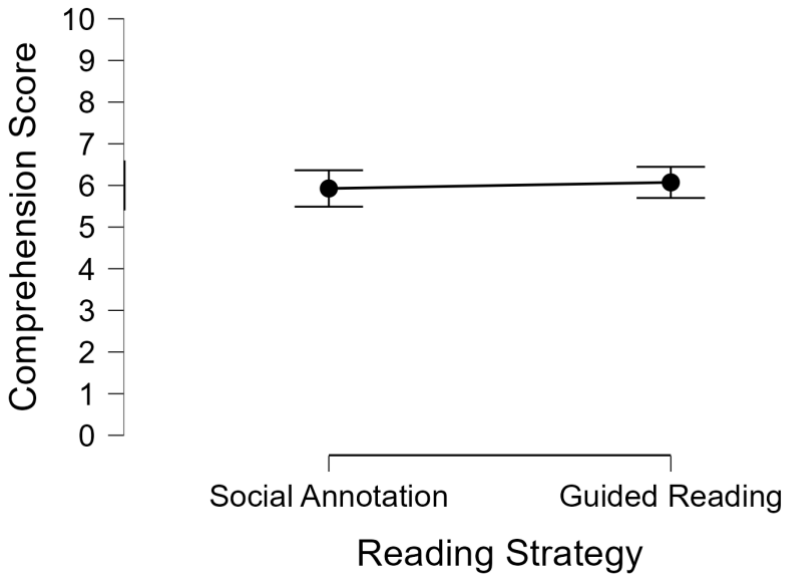
When all quizzes were combined, regardless of assignment number, the mean score (of 10 possible points) was 5.92 (SD=1.8) for the social annotation group and 6.07 (SD=1.55) for the guided reading group. The t-test revealed no significant difference between the two reading strategies over all quizzes (t=-0.507, df=135, p>.05). Descriptive statistics and t-test results for all quizzes combined are found in Table 2. Figure 3 depicts the difference between group means for all literal comprehension quizzes combined.

Table 2. Descriptives for all quizzes combined

	Group	N	Mean	SD	SE	t	df	Sig
Amount read	Social annotation	66	2.4	0.82	0.10	1.94	132	.02*
	Guided reading	68	2.1	0.91	0.11			
Comprehension	Social annotation	68	5.9	1.80	0.21	-0.5	135	.306
	Guided reading	69	6.0	1.55	0.18			
Inference	Social annotation	68	3.3	2.24	0.27	.97	128	.167
	Guided reading	69	2.9	1.80	0.21			

*=statistically significant ($p<.05$; one-way analysis); Amount read for each assignment (1=nothing read, 2=some read, 3=most read, 4=all read); Literal comprehension quizzes were out of 10 possible points; Inference quizzes were out of 8 points.

Figure 3. Literal comprehension score over all quizzes by reading strategy



Inference

To determine whether social annotation or general guided reading strategies led to better inference (deeper) comprehension of assigned readings, results of application quizzes were compared between reading strategy groups using t-tests.

Inference comprehension quiz 1

For quiz one, 14 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 8 possible points) was 4.29 (SD=2.05) for social annotation and 3.53 (1.32) for general guided reading. A t-test revealed no significant difference between the two reading strategy groups (t=1.238, df=29, p>.05).

Inference comprehension quiz 2

For quiz two, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 8 possible points) was 2.78 (SD=2.18) for social annotation and 2.59 (SD=1.8) for general guided reading. A t-test revealed no significant difference between the two reading strategy groups (t=.279, df=33, p>.05).

Inference comprehension quiz 3

For quiz three, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of 8 possible points) was 2.0 (SD=1.78) for social annotation and 2.12 (SD=1.53) for general guided reading. A t-test revealed no significant difference between the two reading strategy groups (t=-.209, df=33, p>.05).

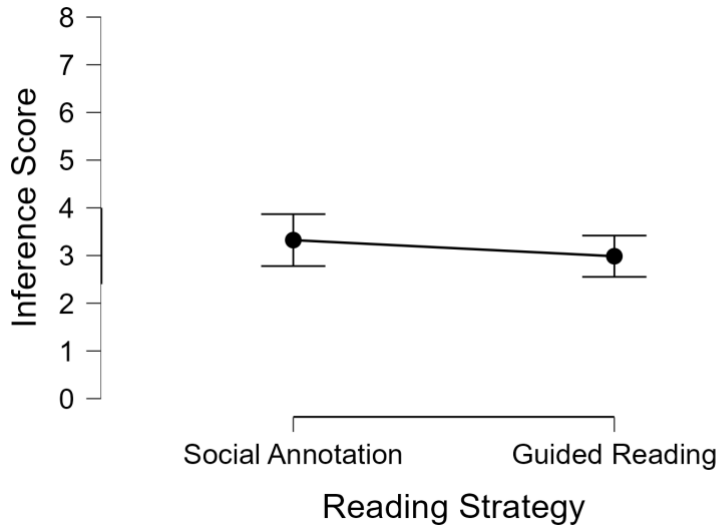
Inference comprehension quiz 4

For quiz four, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The mean score (of eight possible points) was 4.44 (SD=2.12) for social annotation and 3.71 (SD=2.14) for general guided reading. A t-test revealed no significant difference between the two reading strategy groups (t=1.024, df=33, p>.05).

All inference comprehension quizzes combined

When all quizzes were combined, regardless of assignment number, the mean score (of eight possible points) was 3.32 (SD=2.24) for the social annotation group and 2.98 (SD=1.8) for the guided reading group. Independent t-test revealed no significant difference between the two reading strategies over all testings (t=.97, df=128, p>.05). Descriptive statistics and t-test results for all quizzes combined are found in Table 2. Figure 4 depicts the difference between group means for all inference quizzes combined.

Figure 4. Inference comprehension score over all quizzes by reading strategy



Amount read

To explore how each strategy may have influenced the amount read, students self-reported how much of every assigned reading they completed. Students reported reading none (1 score), some (2 score), most (3 score), or all (4 score) of the assigned reading. A series of t-tests were used to determine if group-level differences existed based on the reading strategy employed.

Assignment 1

For reading assignment one, 14 students utilized the social annotation strategy and 17 students read with general instructor guidance. The social annotation group reported reading, on average, 2.64 (between some and most, SD=.633) and the general guided reading group reported reading, on average, 2.65 (between some and most, SD=.862). A t-test revealed no significant difference between the two groups (t=-.15, df=29, p>.05).

Assignment 2

For reading assignment two, 18 students utilized the social annotation strategy and 17 students read with general instructor guidance. The social annotation group reported reading, on average, 2.83 (between some and most, SD=.786) and the general guided reading group reported reading, on average, 1.94 (between none and some, SD=.748). A t-test revealed a significant difference between the two groups (t=3.437, df=33, p<.001, Cohen's *d*=.768). The social annotation group read significantly more than the general instructor guidance group and the effect size (Cohen's *d*) was large.

Assignment 3

For reading assignment three, 18 students utilized the social annotation strategy and 16 students who read with general instructor guidance reported the amount read. The social annotation group reported reading, on average, 2.33 (between some and most, SD=.485) and the general guided reading group reported reading, on average, 2.44 (between some and most, SD=1.03). A t-test revealed no significant difference between the two groups (t=-.384, df=32, p>.05).

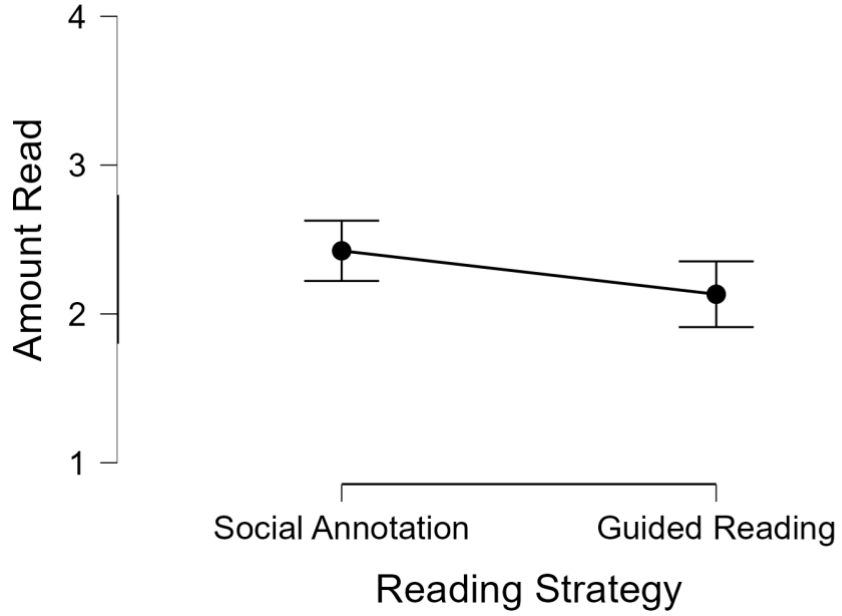
Assignment 4

For reading assignment four, 16 students reported utilizing the social annotation strategy and 17 students read with general instructor guidance. The social annotation group reported reading, on average, 1.88 (between none and some, SD=1.02) and the general guided reading group reported reading, on average, 1.53 (between none and some, SD=.624). A t-test revealed no significant difference between the two groups (t=1.178, df=31, p>.05).

All assignments combined

After combining all assignments, regardless of assignment number, the social annotation group reported reading, on average, 2.42 (between some and most, SD=.82) and the general guided reading group reported reading, on average, 2.13 (between some and most, SD=.91). A t-test revealed no significant difference between the two groups in a one-way analysis (t=1.94, df=132, p=.054). Descriptive statistics and t-test results for all assignments combined are found in Table 2. Figure 5 depicts the difference between group means for all assignments combined.

Figure 5. Amount reported read by reading strategy for entire project



Post-hoc analyses

Because no difference between the groups regarding how much they read was noted, the authors sought to explore if the amount respondents reported reading predicted scores on the literal comprehension and inference comprehension quizzes. For the literal comprehension quizzes, the amount a student reported reading was not predictive of the score on the quiz (F=.289, df=1, 132, p=.592). The same was true for the inference comprehension quizzes (F=2.049; df=1, 132; p=.155).

Disposition toward reading

Table 3 summarizes the frequency of "makes sense" versus critical epistemologies apparent in the data. An example of a "makes sense epistemology" for the goal disposition was, [When I complete assigned readings, my goal is] ". . . to fully understand what I just read." For the purpose disposition, a "makes sense epistemology" example from the data read, [The purpose of assigning readings to

students is] “to inform students in . . . ways that can complement assignments and lecture discussions.” On the other hand, a “critical epistemology” for the goal disposition was, [My goal when completing assigned readings is] “to apply it in the real world.” For the purpose disposition, a “critical epistemology” was evident from the statement, [The purpose of assigning readings to students is] “to learn and see different perspectives to use in real situations.” For the goal disposition, the percentage of students demonstrating a “makes sense” epistemology toward their own reading goals increased by 2%. However, the difference in the number of total students reporting pre- and post-study makes comparison difficult. It is likely that if the same number of participants were represented pre- and post-study, the number could have been unchanged. Similarly, the percentage of students who demonstrated a critical disposition toward their own reading goals decreased from pre- to post-study, but a definitive comparison given the difference in participant numbers is not possible. It is possible that the disposition, overall, remained unchanged.

For the “purpose” disposition, a similar interpretation can be made. More students reported a “makes sense” disposition post-study compared to pre-study. Fewer students reported a critical disposition for the purpose of assigning readings post-study. However, as with the goal disposition, it is possible that the purpose disposition, overall, remained unchanged.

Table 3. Student dispositions toward reading assignments

	Goal disposition	
	Makes sense	Critical
Pre-study (N=30)	12 (40%)	17 (57%)
Post-study (N=36)	15 (42%)	19 (53%)
	Purpose disposition	
	Makes sense	Critical
Pre-study (N=30)	25 (83%)	4 (13%)
Post-study (N=36)	31 (86%)	3 (8%)

Note: *If a participant did not answer the question asked or left it blank, it was not counted but the individual does show up in the total number of participants pre- and post-study. Goal disposition: When you complete an assigned reading for your course, what is your goal above and beyond simple completion of the assignment? Purpose disposition: What purpose do you think assigned readings serve in this course?

Survey results

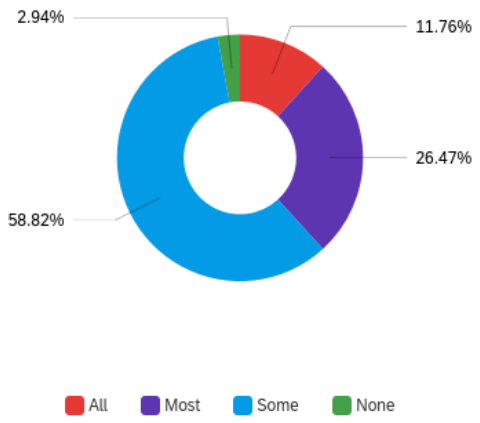
To explore student perceptions of the reading assignments regarding facilitators and barriers to completing and understanding them, an anonymous survey was completed online via the *Qualtrics*™ web-based survey platform. Appendix B outlines all survey items presented.

Amount read

The participating students (N=34) reported how much of the assigned readings, over the entire project, they read. Mean amount read was 2.53 (between some and most), (SD=.74, range=1-4, meaning “none” to “all”). Figure 6 breaks down the percentage of students reporting each category

for amount read. Four students reported reading "all," nine reported reading "most," 20 reported reading "some," and one student reported reading "none."

Figure 6. Self-reported total amount read over the entire project (N=34)



Reasons for not reading

When asked what kept the students from completing all the assigned readings and "time" as a reason was *not* specifically disallowed as a response, "time" was mentioned 11 times out of 29 total responses. Related to time, 10 responses included that the participants had other responsibilities (e.g., work, other assignments, clinic preparation). Perceived excessive length of readings was mentioned seven times, and the difficulty of the assigned readings was also mentioned seven times. Three of the responses included that the students perceived that the readings were not likely to be helpful in learning the course content, and two responses mentioned that reading was not necessary when there was no grade attached. Of note, a single response could contain multiple reasons.

When students were asked to provide reasons for not completing the readings, other than time, not fully understanding the readings was mentioned five times (out of 15 total responses). Two responses included that readings were not fully completed because no grade was attached and another two responses included that the readings were too long. The following reasons were each mentioned once within the 15 total responses: lack of interest in the subject matter, readings were repetitive with in-class lectures/activities, readings contained too much information at once, other school-related responsibilities were more of a priority, and the timing of the assigned reading (before covering the material in class versus after the material was presented in class).

Benefits of reading

When asked if there was any perceived benefits to reading when the student completed at least some of the assigned readings, over half of 31 respondents (18; 58.06%) responded "yes," nine (29.03%) responded "maybe," and four (12.9%) responded "no."

Explanation of perception of reading benefit

When asked to explain why a student responded "yes," "maybe," or "no" regarding whether assigned readings were beneficial, 15 responses (of 30 total) included that reading helped them better understand or remember the material in some way. Six of the responses included that the readings were difficult to understand or not clear (although one response specifically mentioned that the

readings were easy and clear). Four responses included that learning from lecture is easier than learning from assigned readings and two responses specifically mentioned that the annotation activity helped them better focus on the material when reading. Each of the following responses were mentioned one time each: “Reading some is better than none” and the readings “were a waste of time.”

Comprehension of readings

When asked how much of a reading the student typically understood, they reported understanding (of 31 total respondents): 90%- 1 responded, 80%- 3 respondents, between 70-79%- 8 respondents, 60-69%-5 respondents, 50-59%-6 respondents, 40-49%- 4 respondents, 30-39%- 3 respondents, and 20%- 1 respondent.

Barriers to reading comprehension

When asked what kept the students from understanding the assigned readings, 29 total responses were generated. Most responses (18) included that unfamiliar vocabulary (e.g., medical terms) and insufficient background impeded reading comprehension. Five responses included that the readings were simply too long, four responses included that the independent nature of reading made it difficult to understand (there is no one to ask for clarification), and two responses included that the way textbook information is presented (e.g., diagrams and heavily detailed information) was a barrier to comprehension. The following barriers to comprehension were mentioned once each: reading is “just not enjoyable” and the ability to focus during reading is difficult.

Instructor support for comprehension

When asked if instructor support would be helpful in understanding what was read, most of the 32 participants (26, 81.25%) responded “yes,” five (15.63%) responded “maybe,” and one (3.13%) responded “no.”

When asked how an instructor could support their reading comprehension, 29 responses were generated. Within these responses, seven suggested it would be beneficial if instructors reviewed the main ideas from the readings in general or by using technology (such as anonymous response systems) or embedding main ideas from the readings into lecture materials (such as slide decks). Six responses suggested that reading comprehension could be enhanced by providing specific guidance regarding important aspects of the readings (e.g., main ideas, ungraded questions to answer) before readings were completed. Four responses specifically mentioned formal vocabulary instruction before reading in order to enhance comprehension, and four additional mentions were noted in which respondents recommended presenting material in alternative forms (e.g., use of visuals instead of text, case examples rather than exposition). The following suggestions were noted one time each: quick instructor response to questions during reading, instructor use of direct quotes from readings during lecture, and requiring graded collaborative annotation of readings.

DISCUSSION

This research project primarily aimed to compare the effectiveness of peer-guided questioning using social annotation against individual reading with general instructor guidance in enhancing both literal and inferential comprehension of assigned readings in a graduate speech-language pathology course. Originally, the secondary goal was to identify how to integrate the more successful reading strategy into the course curriculum. After a necessary pivot based on initial findings, the study sought to examine students’ attitudes towards assigned readings, including their completion rates.

There did not appear to be a superior reading strategy for improving reading comprehension at the literal or inference level. While the guided reading group did score significantly higher on quiz one (with a large effect, Cohen's *d*=1.49), this did not hold true for the subsequent literal comprehension quizzes, nor did it hold true when all literal comprehension quizzes were combined. There was never any measured difference in inference quiz scores across the entire project.

There are a number of possible explanations as to why there was no difference noted between the reading strategies that were not related to the effectiveness of the strategies themselves. First, there could be too little variation in the amount students read to differentiate between the reading strategies. However, looking at means and standard deviations in Table 1, there was some variation, and there is no agreed upon "amount" of variation necessary to use inferential statistics to analyze data. When looking at the amount read by group across reading assignments, the amount of standard deviation as percent of the group mean ranged from a low of 20% (for the social annotation group, "amount read 3" assignment) to 54% (for the social annotation group, "amount read 4" assignment). This suggests variability in the amount read.

Second, it is possible quizzes that did not contribute to a final grade were not motivating enough for students to prioritize doing well on them. Oreopoulos and Petronijevic (2019) reported that students, despite professing motivation to improve study skills, often failed to change behaviors that were leading to less optimal study skills. One explanation these authors provided for this is that students reassess their expected abilities and preferences for studying during a given semester and revise based on this reassessment. For this study, students may have revised their testing behavior on the quizzes because they were constantly reassessing their abilities and preferences in light of other responsibilities. Given that there was no extrinsic "reward" for doing well on the quizzes, there may have been an overall lack of effort.

Third, there was little evidence that the reading strategy employed affected the amount a student read. For assignment two, the social annotation group reported reading significantly more than the guided reading group, but this did not remain consistent across other assignments nor was a difference in the amount a student reported reading noted when all assignments were combined. While it is not possible to know how much a student read unless they are observed actually reading, self-report of the amount read was the best approximation possible in a functioning educational setting. We acknowledge that this measure is imperfect and that, given the "field" nature of the educational context, it is highly likely that other factors, outside of the reading strategy, affected the amount students read for each assignment. For example, having other assignments due in the same week as a reading assignment may have affected the amount a student read in addition to (or instead of) the reading strategy they were assigned.

While the two reading strategies employed do not seem to encourage more reading when compared, neither seemed to encourage less reading either. In fact, post hoc regression analysis suggested that the reading strategy assigned was not at all predictive of the score on either the literal comprehension or inference comprehension quizzes. It is possible that the reading interventions were not designed to increase the amount read, although requiring a student to do something with a written text would, logically, encourage reading that text. It is, therefore, possible that, as Oliver (2022) recommended, a tie between the reading, some kind of discussion, and the professional importance of the information for the future were not made explicit to the participating students. Therefore, no motivation to complete the readings was present. There was a clear tie between the reading and discussion (discussion taking place via social annotation through peer-guided questioning), but the relevance to the students' future professional practice may have not been present.

Related, students' dispositions toward assigned readings were likely unchanged across the project. While a small increase in "makes sense" epistemology was noted pre- to post-project, unequal numbers of respondents made a trustworthy conclusion regarding any change in disposition difficult. It is likely that there was no change in disposition pre- to post-project.

Overall, students reported not reading all assignments, although most reported benefits from reading at least some of the assignments. The most frequently reported barrier to not completing all readings was—when time was allowed to be a response—time. Since no instructor can create time for another person, it is more fruitful to focus on reported barriers that are more actionable. In order of frequency of report, other barriers included other responsibilities (such as assignments for other classes/clinic), length of readings, the complexity of the readings (difficult to understand), readings being perceived as unhelpful, and a lack of motivation to complete readings with no grade attached (as was the case in this project). Interestingly, when respondents were asked to provide barriers other than time, most reported that they did not understand the readings.

The lack of understanding of the readings also showed up in participants' responses on the benefits of completing assigned readings. In fact, 14/31 responses reported only understanding up to 60% of what was read (range was 20%–90% overall). When asked what about the readings was difficult, most reported that unfamiliar vocabulary and insufficient background in the subject were the greatest barriers to comprehension. This is not surprising given that unfamiliar vocabulary increases the cognitive load (Sweller 1994) required to understand the information being presented in a reading and to, then, store that information for later retrieval (memory). Typically, in instructional design literature (Mayer, Heiser, and Lonn 2001), reduction of cognitive load during a learning task is warranted to facilitate learning (comprehension and memory; Clark and Mayer 2016).

Most students (>80%) indicated that instructors can employ strategies to improve reading comprehension. Respondents indicated that it would be helpful if instructors reviewed the main ideas from readings, provided guidance before readings are completed (e.g., provide questions to answer while reading), provided some explicit vocabulary instruction before reading, and, if possible, provide alternative forms of content delivery (though instructors do not have control over the format of information delivery in a textbook or journal article).

Although the SoTL project was not successful in determining a superior reading strategy to improve students' reading comprehension and the frequency with which they complete assigned readings, several actionable conclusions emerged. First, it appears that some higher education students lack the necessary levels of literacy to use written text as a source of information for learning in college-level work (Bettinger and Long 2009). This lack of higher literacy levels may transfer into graduate programs, but it might be possible to help facilitate expanded literacy skills, particularly as they relate to learning discipline-specific content. The results of this SoTL project suggest instructors could frame content before assigning readings (e.g., provide foundation of main ideas and/or provide explicit vocabulary instruction). This may facilitate greater reading comprehension for students who complete the readings.

Second, students reported that completing at least some of the readings is beneficial to learning but most never completed all readings, largely due to time or other responsibilities. Instructors can, however, break readings up into shorter lengths to encourage completion of all assigned readings. There are likely sections of larger readings that may not be relevant to a particular topic or that could be addressed in an alternative manner (e.g., through lecture instead of only via assigned reading).

Last, instructors might consider creating accountability for completing assigned readings. Traditionally, grades have served as extrinsic motivation for students of all ages, including adult

students in graduate programs (Walden 2022). Other forms of accountability also exist, such as contracts with students in which they agree to perform a number of predefined tasks in order to "pass" a given course module. In this case, a grade on a quiz may not be the goal, but completing a specific number of readings to "pass this module" could serve as the accountability measure.

LIMITATIONS

This SoTL project aimed to address teaching and learning challenges in a local context and the findings may not generalize to broader student populations. Additionally, a number of limitations to this study's findings are apparent. First, while striving for a systematic approach, results should be applied cautiously to other classrooms, considering student population differences. Additionally, relying on student self-reporting introduces potential bias (Gao et al. 2023), although this is often the most feasible data collection method in classrooms. Despite strategies to encourage truthful reporting (voluntary and anonymous participation), over- or under-reporting remains possible. Additionally, the metacognitive reading strategy from one assignment could have influenced subsequent readings.

Lastly, although reading quizzes were scored, they did not affect student grades to avoid coercion and unnecessary course requirements. However, this may have inadvertently reduced external motivation for deep engagement. Finally, the small comparison group sizes might have obscured minor differences in quiz-level comparisons, prompting the authors to pool quiz data for analysis.

REFLECTIONS ON THIS PROJECT

This project revealed unchallenged assumptions about student reading habits. Students did not consistently complete assigned readings, hindering the study's focus on reading comprehension strategies. Prioritizing reading compliance, as suggested by some research (Gorzycki et al. 2020; Maurer and Cabay 2023; Maurer and Shipp 2021; Oreopoulos and Petronijevic 2019), may have been more beneficial.

Interestingly, students requested more support with complex texts and suggested different strategies than those chosen in this study, highlighting the importance of learners as co-investigators in SoTL work. Their input could have helped challenge initial assumptions and potentially shaped the project's direction. While student participation is crucial, it must be voluntary and not compromise their academic experience. This is a key takeaway for future projects across disciplines.

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DATA AVAILABILITY STATEMENT

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

DISCLOSURE

None.

ETHICS

Research was approved through the Monmouth University ethical review process.

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