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Effectiveness of an Informational Video for Establishing Students' Basic Knowledge of Post-Stroke Aphasia

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Abstract

The purpose of this study was to investigate changes in knowledge of post-stroke aphasia among students who watched an informational video (Kennedy et al., 2012a) created for this study compared to students who read an informational text (National Aphasia Association, n.d.). Participants included 136 undergraduate and graduate students who completed a pre-test, watched an informational video or read an informational text, completed a post-test, and then completed a maintenance test approximately four weeks later. Results of a one-way mixed ANOVA showed a statistically significant main effect of time, no statistically significant main effect of group, and no statistically significant time-by-group interaction. Both groups demonstrated a substantial increase in knowledge of post-stroke aphasia from pre-test to post-test. These results suggest that the informational video and the informational text may be effective methods to teach students basic information about post-stroke aphasia.

Keywords

Informational video, informational text, post-stroke aphasia, aphasia

In the traditional university classroom, class time is used for lectures to present course content; supplemental activities and problem-solving tasks are completed outside of class (Hotle & Garrow, 2015). Often, students are assigned textbook readings to complete before class to prepare for the lecture (Sharma et al., 2013). However, student compliance with pre-class textbook reading is low. When students fail to complete assigned readings, they miss content from the course and potentially compromise their learning (Hoeft, 2012). Hoeft (2012) conducted a Scholarship of Teaching and Learning (SoTL) study that assessed reading compliance in undergraduate students in two, first-year seminar sections consisting of 100 and 24 students. Only 46% of students reported completing assigned readings. Of the students who read the assigned material before class, 55% demonstrated basic comprehension of the content, which was assessed by instructing the students to paraphrase the reading in three sentences. The author evaluated the paraphrases for any indication that the students had read the assigned reading, such as the inclusion of an idea portrayed in the reading, to determine basic comprehension. The most common explanation for noncompliance was related to the amount of reading assigned (Hoeft, 2012).

Flipped classrooms offer an alternative to the traditional approach and have been increasingly used in recent years to enhance student learning through application of content. In a flipped classroom, students acquire core content via recorded lectures and other supplemental materials before coming to class. The allotted class time is then used for problem-solving, application, and expansion of the content learned before class. Instructors are generally able to offer more valuable assistance while students work to apply previously learned content (Hotle & Garrow, 2015). Flipped classrooms may enhance student learning compared to the traditional approach, given the low reading compliance for undergraduate students (Hoeft, 2012; Hotle & Garrow, 2015). However, there is still the possibility that students will fail to complete content-acquisition tasks, such as assigned reading, before class and therefore limit their ability to participate in application and expansion of the material during class (Hotle & Garrow, 2015). Thus, professors may need to consider other instructional materials, such as Content Acquisition Podcasts (CAPs), to ensure that students acquire key content to be successful in the course.

CAPs as an Alternative Learning Approach

CAPs are an enhanced form of traditional podcasts designed to align with Mayer's (2008) Cognitive Theory of Multimedia Learning (Kennedy et al., 2012; Kennedy & Thomas, 2012). Although multiple SoTL studies have provided empirical support for using CAPs to support classroom instruction in higher education, their use in communication sciences and disorders (CSD) specifically has not yet been examined. CAPs are brief videos used for informational purposes that are designed to (a) limit extraneous processing, (b) manage essential processing, and (c) foster generative processing. Mayer (2008) argues that multimedia learning, which involves both images and words to present information, supports these different levels of processing to maximize knowledge retention. The distinguishing feature of CAPs is that they incorporate images, on-screen text, and audio synced into a single presentation intended to maximize retention of critical information of a particular topic. They are typically 5-10 minutes long and present only the most essential information about a single topic (Kennedy et al., 2012; Kennedy & Thomas, 2012).

CAPs consistently have been found to be more effective than traditional approaches for presenting content related to special education. Specifically, CAPs have been used to provide basic information about (a) schoolwide positive behavior interventions and supports (Kennedy & Thomas, 2012), (b) curriculum-based measurement (Kennedy et al., 2016), (c) learning disabilities (Kennedy et al., 2012), and (d) high-functioning autism (Kennedy et al., 2012) for undergraduate students majoring in education (i.e., pre-service educators).

Kennedy and Thomas (2012) conducted a pre-test-post-test-maintenance design SoTL study to investigate whether students at two universities who watched a CAP about schoolwide positive behavior interventions and supports outperformed participants who read an assigned text on a post-test and on a maintenance test that was given two weeks after the post-test. The results from this study indicated that the CAP promoted greater knowledge gains on the post-test than the text for participants at both universities. The results also indicated that the CAP promoted superior outcomes on the maintenance test relative to the text, suggesting that CAPs may offer some benefit for knowledge retention over time (Kennedy & Thomas, 2012).

Additionally, Kennedy and colleagues (2016) conducted a pre-test-post-test-maintenance design SoTL study to assess whether watching a CAP about curriculum-based measurement resulted in greater learning outcomes, increased application skills, and higher motivation for teacher candidates than reading an article of the same content. Participants were randomly assigned to study groups. Dependent measures consisted of a multiple-choice instrument, an open-ended application prompt, and the Situational Motivation Scale (Guay et al., 2000). The Situational Motivation Scale is a self-reported measure of motivation completed during a task that assesses constructs including intrinsic motivation, identified regulation, external regulation, and amotivation (Guay et al., 2000). Both the CAP group and the text-only group were instructed to pause at pre-determined increments to take notes on the presented content and to complete the Situational Motivation Scale. The CAP group scored significantly higher than the text-only group on a multiple-choice instrument and on an open-ended application prompt at the post-test and maintenance time points. Additionally, intrinsic motivation (i.e., engagement in a behavior due to resulting satisfaction) and identified regulation (i.e., engagement in a behavior voluntarily due to associated value) ratings increased throughout instruction in the CAP group but not in the text-only group. These results suggest that the CAP fostered (a) greater recall of knowledge, (b) greater application of learned skills, and (c) increased motivation to engage in the instruction (Kennedy et al., 2016).

Further, Kennedy and colleagues (2012) examined the optimal order of CAP presentation for student learning. They evaluated whether presenting a CAP as a preview to a textbook reading (i.e., pre-CAP) or a review of a textbook reading (i.e., re-CAP) resulted in different learning outcomes when compared to a control group who only completed a textbook reading. The special education topics covered by Kennedy and colleagues, (2012) were learning disabilities and high-functioning autism. Learning outcomes were assessed with a pre-test and a post-test. Both the pre-CAP and re-CAP groups significantly outperformed the control group on the post-tests for learning disabilities and high-functioning autism. There were no significant differences noted between the pre-CAP and re-CAP groups on the post-test, indicating that the sequence of presentation of CAPs may not significantly affect learning (Kennedy et al., 2012).

CAPs in Non-CSD Disciplines

Although CAPs appear to be an efficient and effective means for supporting basic knowledge acquisition, the current research on the effectiveness of CAPs focuses on topics surrounding pre-service teacher education (Kennedy et al., 2016; Kennedy et al., 2012; Kennedy & Thomas, 2012). There is currently a lack of evidence addressing the effectiveness of CAPs in other disciplines, including speech-language pathology. The current study aims to expand on previous research of the effectiveness of CAPs for teaching students about topics in special education to a topic within the discipline of speech-language pathology: post-stroke aphasia.

Scholarship of Teaching and Learning in Speech-Language Pathology

Most existing SoTL work in CSD focuses on students' experiences rather than basic knowledge acquisition. For example, Affoo and colleagues (2020) investigated speech-language pathology graduate students' perceptions and performance in an active learning-oriented swallowing and dysphagia course that used a flipped classroom approach. Students watched lecture videos and completed a reading assignment to acquire content, and they applied the content during class time through various tasks and activities. The results of this study suggest that the active learning-oriented course design positively influenced student perceptions of the course with themes including (a) the environment, (b) active learning interactions, (c) relationships, (d) instruction, and (e) in-class activities. The results also suggested a positive correlation between active learning factors and class performance.

For this study, we chose to focus on students' knowledge of post-stroke aphasia. We chose this focus because SLPs who work with adults in health care settings report spending a substantial proportion of time serving patients with aphasia (American Speech-Language-Hearing Association, [ASHA], 2019) and because public awareness of aphasia is alarmingly low worldwide, despite its high prevalence in patients after stroke (Berthier, 2005; Flynn et al., 2009; Simmons-Mackie et al., 2020). In a review of 16 studies, Simmons-Mackie and colleagues (2020) found that less than 20% of individuals who had heard the term "aphasia" could recall basic information about aphasia (e.g., causes speech or language difficulties; caused by brain damage). They reported that many individuals who had heard the term "aphasia" provided inaccurate descriptions of the disorder. We expected that knowledge of aphasia would be similarly low among incoming CSD students.

Specific to aphasia, SoTL work has focused on students' skills and experiences as conversational partners for individuals with aphasia (e.g., Finch et al., 2017; Jagoe & Roseingrave, 2011) rather than on basic knowledge acquisition. Finch and colleagues (2017) investigated the effectiveness of communication partner training on the communication skills of speech-language pathology students when communicating with individuals with aphasia. The experimental group received training on communication strategies via a lecture while the control group received no training. The results of the study suggest that the training was effective in improving communication skills of speech-language pathology students when communicating with people with aphasia.

Additionally, Jagoe and Roseingrave (2011) investigated the experiences of first-year speech-language pathology students through letters written to themselves before and after a conversation

partner scheme module for people with aphasia. Students wrote a letter to themselves following the first tutorial and the final tutorial. The themes which emerged from the letters reflected increased understanding of aphasia and its effect on individuals who experience it, the importance of communication for facilitating participation in daily life, and an increased ability to see beyond language difficulties in people who live with aphasia.

Purpose. Multiple studies have demonstrated the effectiveness of CAPs for teaching fundamental concepts in pre-service teacher education (Kennedy et al., 2012; Kennedy et al., 2016; Kennedy & Thomas, 2012). However, the effectiveness of CAPs has not been evaluated for concepts in other disciplines, including speech-language pathology. More specifically, the effectiveness of CAPs for teaching university students about post-stroke aphasia has not yet been evaluated. The initial purpose of the current study was to evaluate the effectiveness of a short informational video, similar to a CAP, to establish basic knowledge of post-stroke aphasia among CSD students. Due to difficulties with participant recruitment, the study sample was expanded to include university students across disciplines. The findings remain relevant to teaching and learning in CSD and may carry implications for raising public knowledge of aphasia.

We investigated the following research question: Do students who watch an informational video about post-stroke aphasia demonstrate superior learning outcomes compared to students who read a text on the same topic? We hypothesized that students who watched the video would outperform students who read the text on an immediate post-test that assesses knowledge of aphasia. Additionally, we hypothesized that the students who watched the video would outperform students who read the text on the maintenance test administered approximately four weeks after the post-test.

Method

The University of Georgia Institutional Review Board reviewed and approved the methods used in this study prior to data collection. We used an experimental pre-test-post-test-maintenance design with random assignment to evaluate whether participants demonstrated superior learning outcomes by (a) watching an informational video or by (b) reading an informational text about post-stroke aphasia.

Participants. Participants were 136 undergraduate and graduate students. Participants were recruited in two waves. Wave one included a cohort of students who had been accepted into the CSD undergraduate program at the University of Georgia. Initial recruiting efforts were targeted to this group given the relevance of post-stroke aphasia to the CSD field. These incoming CSD students had not yet taken any CSD-specific courses that would have exposed them to aphasia-specific content, so it was assumed that they had little to no prior knowledge of aphasia. In wave one, approximately 70 incoming CSD students were recruited but only approximately 6% completed the study.

Due to limited participation in wave one, wave two included all University of Georgia students enrolled in at least one course during a summer term. It was assumed that this wave of participants also had little to no prior knowledge of post-stroke aphasia, given that there is low public knowledge of post-stroke aphasia in the general population (Simmons-Mackie et al., 2020).

Participants ranged in age from 18 to 66 years, with an average age of 22.52 and a median age of 21 years. Additional demographic information for the sample is provided in Table 1. There were no notable differences in demographics between CSD students and non-CSD students in the sample. The participants who were CSD students were primarily white undergraduate females, consistent with the total population of participants.

Materials.

Informational Text. The informational text used in this study is entitled "Aphasia Definitions" (National Aphasia Association, n.d.). This text is available online at https://www.aphasia.org/aphasia-definitions/. It provides a general description of aphasia as well as an overview of the various language deficits that may emerge in patients with aphasia including difficulties with (a) comprehension of spoken language, (b) speech fluency, and (c) repetition skills. The text provides descriptions of common deficits in (a) global aphasia, (b) Broca's aphasia, (c) mixed non-fluent aphasia (i.e., mixed transcortical aphasia), (d) Wernicke's aphasia, (e) anomic aphasia, and (f) primary progressive aphasia. It also provides a graphic of symptom classification for the eight primary types of aphasia. Primary progressive aphasia was excluded from the text presented in this study because of its non-stroke etiology and degenerative nature (National Aphasia Association, n.d.). The text has a Flesch-Kincaid readability score of 46.5, which is falls in college-level range (Good Calculators, n.d.). This readability score was considered appropriate for the participants, as they were all enrolled university students.

Informational Video. The informational video for this experiment was developed based on the content in the informational text. We used methods of creating a CAP described in Kennedy and Thomas (2012) and Kennedy and colleagues (2012) to create the video. It provides images, on-screen text, and audio that are synced to present the most critical information on post-stroke aphasia. The video aligned with Mayer's Cognitive Theory of Multimedia Learning by using both words and images to present information, thus limiting extraneous processing, managing essential processing, and fostering generative processing to maximize knowledge retention (Mayer, 2008). The video is 3 minutes and 33 seconds long. The language in the video narration, though it was not read by participants, has a Flesch-Kincaid readability score of 43.3, which is falls in college-level range (Good Calculators, n.d.). This score is similar to the readability of the informational text and was considered appropriate for the participants, as they were all enrolled university students. Both the text and the video included long, multi-clausal sentences and multisyllabic vocabulary words. The video can be accessed at https://vimeo.com/1003628880.

Measure. The measure, referred to as the aphasia knowledge assessment, was created for this study. The same measure was administered to both groups during each phase of data collection. It included 14 multiple-true-false questions and 4 traditional multiple-choice questions based on the content presented in the text and the video. Multiple-true-false questions are multi-select questions, where questions can have more than one correct choice. This type of question provides a more thorough picture of student understanding than traditional multiple-choice questions (Couch et al., 2018). Participants received one point for each correct selection on the multiple-true-false questions and zero points for incorrect or 'I don't know' selections. Traditional multiple-choice questions include one correct selection. Participants received one point for the correct selection on

the traditional multiple-choice questions. The aphasia knowledge assessment is provided in Appendix A for reference. Cronbach's alpha for this measure at the post-test time point was 0.82.

Table 1
Participant Demographics

Characteristic	Experimental (Video) $n = 66$	Control (Text) $n = 70$	Total $n = 136$
Gender			
Female	45 (68.18%)	57 (81.43%)	102 (75.00%)
Male	20 (30.30%)	9 (12.86%)	29 (21.32%)
Non-binary/third gender	1 (1.52%)	4 (5.71%)	5 (3.68%)
Race			
White	45 (68.18%)	43 (61.43%)	88 (64.71%)
Black/African American	6 (9.09%)	9 (12.86%)	15 (11.03%)
Asian	12 (18.18%)	16 (22.86%)	28 (20.59%)
Asian + White	3 (4.55%)	1 (1.43%)	4 (2.94%)
American or Alaska Indian	0 (0.00%)	1 (1.43%)	1 (0.74%)
Ethnicity			
Hispanic/Latino	5 (7.58%)	9 (12.86%)	14 (10.29%)
NOT Hispanic/Latino	61 (92.42%)	61 (87.14%)	122 (89.71%)
Highest Degree Earned			
High school diploma/GED	42 (63.64%)	39 (55.71%)	81 (59.56%)
Associate degree	1 (1.52%)	6 (8.57%)	7 (5.15%)
Bachelor's degree	14 (21.21%)	17 (24.29%)	31 (22.79%)
Graduate degree	9 (13.64%)	8 (11.43%)	17 (12.50%)
Diagnoses			
ADD or ADHD	7 (10.61%)	10 (14.29%)	17 (12.5%)
Autism spectrum disorder	3 (4.55%)	0 (0.00%)	3 (2.21%)
Hearing impairment	4 (6.06%)	3 (4.29%)	7 (5.15%)
Intellectual disability or cognitive impairment	1 (1.52%)	2 (2.86%)	3 (2.21%)
Speech impairment	1 (1.52%)	2 (2.86%)	3 (2.21%)
Traumatic brain injury	1 (1.52%)	1 (1.43%)	2 (1.47%)
None reported	49 (74.24%)	57 (81.43%)	106 (77.94%)
English as Primary Language			
Yes	64 (96.97%)	67 (95.71%)	131 (96.32%)
No	2 (3.03%)	2 (2.86%)	4 (2.94%)
Unsure	0 (0.00%)	1 (1.43%)	1 (0.74%)
Normal Vision			
Yes	25 (37.88%)	31 (44.29%)	56 (41.18%)
No	1 (1.52%)	1 (1.43%)	2 (1.47%)
Corrected-to-normal	40 (60.61%)	38 (54.29%)	78 (57.35%)
Year in School			
Undergraduate	44 (66.67%)	44 (62.86%)	88 (64.71%)
Graduate	20 (30.30%)	21 (30.00%)	41 (30.15%)
Not reported	2 (3.03%)	5 (7.14%)	7 (5.15%)

Note. Of participants who indicated their primary language being a language other than English, Mandarin, Sinhala, and Vietnamese were reported as primary languages. A total of three participants reported being diagnosed with more than one of the listed diagnoses, ranging from two to four diagnoses.

The aphasia knowledge assessment was scored automatically with Qualtrics. Each selection was manually assigned a point value in Qualtrics prior to data analysis. Participants received one point for each correct selection; even if they did not indicate all of the possible correct selections on the multiple-true-false questions, they were awarded a point for any number of correct selections (i.e., partial credit). They received zero points for incorrect or 'I don't know' selections. Scores were the percentage of correct choices selected out of 33 possible correct selections. Individual scores were then generated automatically based on participants' selections.

Measure Creation and Validation. The first author created a bank of questions about post-stroke aphasia based on the text. This bank included multiple-true-false questions. All questions included an '*I don't know'* answer choice to minimize the risk of higher scores due to guessing (Samuel et al., 2019). Undergraduate research assistants reviewed and coded each question to ensure coherence with best practice in question construction (e.g., construct validity, minimal extraneous words, no double-barreled items, no ambiguous items, no leading questions, no double negatives, no grammatical errors). No questions violated best practices for question construction. A speech-language pathologist with expertise in post-stroke aphasia reviewed the questions for content validity, and minor edits were made based on her feedback. Finally, all questions were pilot tested with a small sample of individuals who were not in the CSD field. All questions were judged to possess adequate item characteristics based on objective calculations of item difficulty and discrimination indexes calculated from the pilot sample's responses. All questions were retained for the experimental measure used in this study.

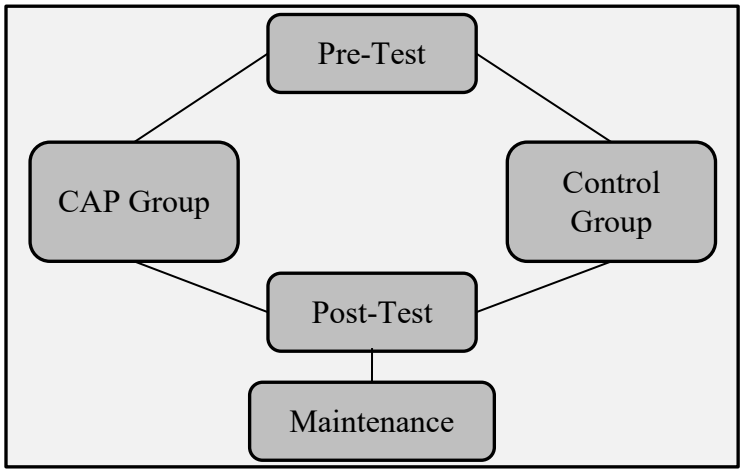
Procedures. The first portion of the experiment was conducted at the CSD undergraduate orientation for students who had been accepted into the program. Approximately two-thirds of the students in the cohort attended the orientation. Students were read a script inviting them to participate in the study and then given the option to participate immediately or to receive an email to participate in the study later. Additionally, the study invitation was emailed to the newly accepted CSD undergraduate students after the orientation via a listserv to reach students who were unable to attend. There were approximately 70 students invited to participate in the study via listserv, some of whom were also present at the orientation. Ultimately, four undergraduate students recently admitted to the CSD undergraduate program participated in the study.

Due to the small sample obtained from the initial recruitment efforts, eligibility was expanded to include all University of Georgia students (undergraduate and graduate level) enrolled in at least one summer course. A recruitment email was sent to 18,145 students; 132 students recruited via this method completed the study. Thus, the total sample was 136.

Participants accessed the study electronically through a direct link that was emailed with the study invitation. All participants provided informed consent by reading a consent form and providing their email addresses before beginning the pre-test. They completed the aphasia knowledge assessment at three time points: pre-test, post-test, and maintenance test. Figure 1 illustrates the study procedures.

Figure 1

Study Procedures



Participants first completed the aphasia knowledge assessment (pre-test) to assess existing knowledge of post-stroke aphasia. After completing the pre-test, participants were randomly assigned by Qualtrics to watch the video (i.e., experimental group) or read the text (i.e., control group). Immediately after watching the video or reading the text, participants repeated the aphasia knowledge assessment (post-test). According to estimated time for completion computed with Qualtrics, the pre-test and post-test should have taken approximately five minutes each to complete. The video was 3 minutes and 33 seconds long. It is estimated that the text should have taken approximately the same amount of time to read based on an online reading duration calculator. Thus, the pre-test, video/text, and post-test portion of the study should have taken approximately 13 minutes. Approximately four weeks after completing the post-test, participants were emailed a link to complete the maintenance test. There were 136 participants who completed the maintenance test, an attrition rate of 19.05% from post-test to maintenance.

Results

Initially, there were 168 participants in this study. However, 32 individuals completed the pre-test and post-test but did not complete the maintenance test (attrition rate of 19.05%). Participants who did not complete the maintenance test were removed from the sample. Table 2 displays demographic information for the attritted individuals in comparison to the participants who completed the entire study. Overall, there are no notable differences in demographics between participants who completed the study and those who were attritted.

Table 2
Completed Versus Attritted Participant Demographics

Characteristic	Completed *n* = 136	Attritted *n* = 32	Total *n* = 168
Gender			
Female	102 (75.00%)	20 (62.50%)	122 (72.62%)
Male	29 (21.32%)	10 (31.25%)	39 (23.21%)
Non-binary/third gender	5 (3.68%)	2 (6.25%)	7 (4.17%)
Race			
White	88 (64.71%)	22 (68.75%)	110 (65.48%)
Black/African American	15 (11.03%)	3 (9.37%)	18 (10.71%)
Asian	28 (20.59%)	6 (18.75%)	34 (20.24%)
American or Alaskan Indian	1 (0.73%)	0 (0.00%)	1 (0.60%)
Black/African American + White	0 (0.00%)	1 (3.13%)	1 (0.60%)
Asian + White	4 (2.94%)	0 (0.00%)	4 (2.38%)
Ethnicity			
Hispanic/Latino	14 (10.29%)	0 (0.00%)	14 (8.33%)
NOT Hispanic/Latino	122 (89.71%)	32 (100.00%)	154 (91.67%)
Highest Degree Earned			
High school diploma/GED	81 (59.56%)	21 (65.63%)	102 (60.71%)
Associate degree	7 (5.15%)	2 (6.25%)	9 (5.36%)
Bachelor's degree	31 (22.79%)	6 (18.75%)	37 (22.02%)
Graduate degree	17 (12.50%)	3 (9.38%)	20 (11.90%)
Diagnoses			
ADD or ADHD	17 (12.50%)	4 (12.50%)	21 (12.5%)
Autism spectrum disorder	3 (2.21%)	0 (0.00%)	3 (1.79%)
Hearing impairment	7 (5.15%)	0 (0.00%)	7 (4.17%)
Intellectual disability or cognitive impairment	3 (2.21%)	1 (3.13%)	4 (2.38%)
Speech impairment	3 (2.21%)	1 (3.13%)	4 (2.38%)
Language impairment	0 (0.00%)	1 (3.13%)	1 (0.60%)
Traumatic brain injury	2 (1.47%)	1 (3.13%)	3 (1.79%)
None reported	106 (77.94%)	24 (75.00%)	130 (77.38%)
English as Primary Language			
Yes	131 (96.32%)	32 (100.00%)	163 (97.02%)
No	4 (2.94%)	0 (0.00%)	4 (2.38%)
Unsure	1 (0.74%)	0 (0.00%)	1 (0.60%)
Normal Vision			
Yes	56 (41.18%)	10 (31.25%)	66 (39.29%)
No	2 (1.47%)	0 (0.00%)	2 (1.19%)
Corrected-to-normal	78 (57.35%)	22 (68.75%)	100 (59.52%)
Year in School			
Undergraduate	88 (64.71%)	22 (68.75%)	110 (65.48%)
Graduate	41 (30.15%)	8 (25.00%)	49 (29.17%)
Not reported	7 (5.15%)	2 (6.25%)	9 (5.36%)

Primary Analysis. This study used an experimental pre-test-post-test-maintenance design with random assignment to either an experimental group (video group) or a control group (text group). Descriptive statistics are provided in Table 3. Data were analyzed using a two-way mixed ANOVA to assess whether there were any statistically significant differences between groups and across testing times throughout the study. The independent variables were testing time (pre-test, post-test, and maintenance) and group (video or text). The dependent variable was score on the aphasia knowledge assessment. There was a statistically significant main effect of testing time, $F(1.82, 244.09) = 221.66$, $p = .01$. There was not a statistically significant main effect of group, $F(1.00, 134.00) = 3.66$, $p > .05$, or a statistically significant time-by-group interaction, $F(1.82, 244.09) = 0.91$, $p > .05$. These results indicate that there were no statistically significant differences in average aphasia knowledge assessment scores between groups at any time point.

Table 3

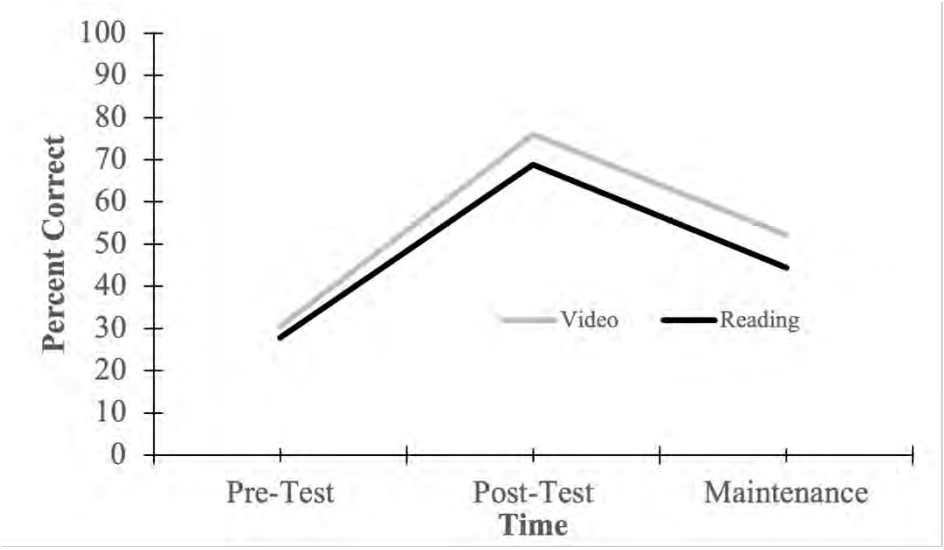
Descriptive Statistics for Performance on Aphasia Knowledge Assessment

		Pre-Test		Post-Test		Maintenance	
Group	*N*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Video	66	30.49	25.25	76.03	16.41	52.16	23.68
Text	70	27.79	23.63	68.83	20.56	44.37	25.17

Figure 2 illustrates the mean scores for each group at each time point. Follow-up *t*-tests were conducted to assess differences in mean aphasia knowledge assessment scores across time points for each group. For the video group, there was a statistically significant difference in mean aphasia knowledge assessment score from pre-test to maintenance, $t(65) = 6.48$, $p < .001$. For the text group, there was a statistically significant difference in mean aphasia knowledge assessment score from pre-test to maintenance, $t(69) = 5.95$, $p < .001$. These results indicate that both groups statistically significantly improved from pre-test scores.

Figure 2

Average Group Performance at Each Time Point



Secondary Analyses.

Education Level. A mixed ANOVA was used to determine whether there was a difference in effectiveness of the CAP compared to the text depending on level of education (e.g., undergraduate vs. graduate). The sample for this analysis included the 129 participants who reported their year in school at the time of data collection. There was not a statistically significant main effect of level of education, $F(1, 125) = 0.002$, $p > .05$, or a statistically significant group-by-time-by-level of education interaction, $F(2,250) = .006$, $p > .05$. These results indicate that level of education did not statistically significantly affect scores.

Individuals with Disabilities. A two-way mixed ANOVA was conducted using the subset of participants who reported having disabilities to determine whether there were any statistically significant differences across time or groups for these participants ($n = 29$). There was a statistically significant main effect of time, $F(2, 56) = 43.63$, $p < .01$. There was not a statistically significant main effect of group, $F(1, 29) = 1.21$, $p > .05$, or a statistically significant time-by-group interaction, $F(2, 56) = 0.32$, $p > .05$. These results indicate that the presence of a disability did not statistically significantly affect scores.

Discussion

The purpose of this study was to assess whether students who watched an informational video demonstrated superior learning outcomes compared to students who read an informational text about post-stroke aphasia. Based on prior SoTL research in special education in which informational videos were used to teach critical information to pre-service teachers (e.g., Kennedy & Thomas, 2012; Kennedy et al., 2012; Kennedy et al., 2016), we hypothesized that students who watched the video would demonstrate superior learning outcomes compared to students who read a text with the same content. However, in this study there were no statistically significant differences between students who watched the video and students who read the text on post-test scores or maintenance scores on the aphasia knowledge assessment.

Although the video group did not outperform the text group as expected, there was a statistically significant main effect of testing time point. On average, scores improved from pre-test to post-test and from pre-test to maintenance for both groups. Participants in the video group demonstrated an approximately 46% increase in average scores from pre-test to post-test and an approximately 21% increase in average scores from pre-test to maintenance. Participants in the text group demonstrated an approximately 41% increase in average scores from pre-test to post-test and an approximately 16% increase in average scores from pre-test to maintenance. Pre-test scores for both groups were particularly low, suggesting poor knowledge of post-stroke aphasia among participants prior to the study. This poor performance was expected because the students had not completed any coursework in aphasia and may suggest that the study sample mirrors the general population in terms of lack of knowledge of aphasia (Simmons-Mackie et al., 2020). Scores on the maintenance test did not return to pre-test averages. This result suggests that students retained some basic information about aphasia over time. Given that both groups demonstrated an increase in scores from the pre-test, the video and the text could be used as a tool to increase knowledge of post-stroke aphasia among students.

Matching Instruction with Student Preferences. Although it has been suggested that newer generations of students who are motivated by technology show more interest in learning through videos (Seemiller & Grace, 2017), a substantial proportion (39%) of students report that they dislike learning from videos (Leatherman & Cleveland, 2020). The effect of including videos in instruction likely depends in part on students' individual preferences. For example, Tse and colleagues (2019) reported positive effects of videos on student satisfaction and teaching effectiveness in math and liberal studies classes specifically for students with low reading motivation. Thus, offering students a choice of learning modality (i.e., videos or readings) when possible may be an ideal option for effective supplemental course.

Bassett and colleagues (2020) conducted a study of students in a partially flipped classroom assessing (a) to what extent students completed assigned readings or watched assigned videos, (b) whether students watched videos more than reading, and (c) whether watching videos or reading the textbook affected exam performance. They found that the majority of students prepared for class by watching assigned videos *and* completing assigned readings. Similar to the current study, they also found that both reading assigned text and watching assigned videos had a positive effect on exam scores. Given that both the video and text were found to be effective, offering students a choice may be an optimal option for flipped classroom learning. Future studies could investigate the effect of student choice on learning outcomes in CSD.

Public Knowledge of Aphasia. In addition to implications for instruction in CSD, the findings from this study may apply to public awareness campaigns relevant to aphasia. Given that the video used in this study resulted in improvement from pre-test knowledge, it may be a beneficial learning tool for teaching basic knowledge of aphasia. Videos may also be more effective as a supplemental learning tool to a primary teaching method such as a lecture rather than a primary mode of learning. For example, an informational video could be used as a summary of lecture content for students to watch after class.

Limitations. The primary limitation of this study is that it was conducted asynchronously online. This approach limited researcher control over the fidelity in which participants completed study tasks. Participants could have looked up answers to the assessment questions to improve their performance or could have completed the study activities with minimal attention. Based on the observed variability in duration for completing study activities and participant response patterns, we suspect that many participants did not engage sufficiently with the study activities to yield a reliable comparison between the video and text conditions.

Future Directions. Further research is needed to establish under what conditions videos and/or texts are most effective for teaching basic information about post-stroke aphasia. Future studies should account for fidelity of participation by increasing control in experimental groups. However, because instructors rarely have adequate control over students' out-of-class behaviors, additional work is needed to evaluate barriers to student compliance and methods for improving student engagement with supplementary learning materials. Finally, future studies could examine the extent to which CAPs are useful for raising public awareness of conditions such as post-stroke aphasia.

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Appendix

Aphasia Knowledge Assessment

1. Aphasia is classified under which of the following impairments? Select all that apply.
    a. Cognitive impairment
    b. Memory impairment
    c. **Language impairment**
    d. Learning disability
    e. I don't know
2. Which of the following deficits may be present in a person with aphasia? Select all that apply.
    a. **Difficulty producing speech**
    b. **Difficulty understanding speech**
    c. **Difficulty reading**
    d. **Difficulty writing**
    e. I don't know
3. Which of the following conditions can result in acquired aphasia? Select all that apply.
    a. **Head trauma**
    b. **Stroke**
    c. **Infections**
    d. Genetic mutation
    e. **Brain tumors**
    f. I don't know
4. Which population of people have the highest risk of acquiring aphasia?
    a. Young children with brain tumors
    b. **Older adults following a stroke**
    c. Older adults following a traumatic brain injury.
    d. Middle-aged adults following a traumatic brain injury.
    e. Any age with a brain infection
    f. I don't know
5. Aphasia may affect which of the following aspects of functioning? Select all that apply.
    a. Cognition
    b. **Word retrieval**
    c. **Ability to form sentences**
    d. **Reading skills**
    e. I don't know
6. The types or patterns of aphasia typically correspond to which of the following? Select all that apply.
    a. Age of the individual
    b. **Relative location of brain injury**
    c. Sex of the individual
    d. Family history of aphasia

e. Handedness
f. I don't know

7. Which of the following are typically impaired in individuals with global aphasia? Select all that apply.
   a. **Comprehension**
   b. **Fluency of speech output**
   c. **Word repetition**
   d. I don't know

8. Which of the following are typically true of an individual with global aphasia? Select all that apply.
   a. Understands utterances of less than 4 words
   b. **Understands little to no spoken language**
   c. **Produces very few recognizable words**
   d. Produces 2–3-word utterances
   e. I don't know

9. Which statement best describes global aphasia?
   a. **Produces very few words that are understandable to listeners and comprehends minimal spoken language**
   b. Fluent speech output
   c. Relatively spared comprehension with severe deficits in speech production
   d. Deficits emerge slowly over time
   e. I don't know

10. Which of the following are typically impaired in individuals with Broca's aphasia? Select all that apply.
   a. Comprehension
   b. **Fluency of speech output**
   c. **Word repetition**
   d. I don't know

11. Which of the following are typically true of an individual with Broca's aphasia? Select all that apply.
   a. **Produce short utterances of less than 4 words**
   b. Produce fluent speech
   c. Understand little to no spoken language
   d. Speak at an increased rate
   e. I don't know

12. Which of the following are typically impaired in an individual with Wernicke's aphasia? Select all that apply.
   a. **Comprehension**
   b. Fluency of speech output
   c. **Word repetition**
   d. I don't know

13. Which of the following are typically true of an individual with Wernicke's aphasia? Select all that apply.
   a. Produce effortful speech
   b. Produce 2–3-word utterances
   c. **Produce fluent speech**

d. **Difficulty understanding spoken language**
e. I don't know

14. Which statement best describes Wernicke's aphasia?
    a. **Impaired comprehension with retained ability to produce connected speech**
    b. Spared comprehension with limited connected speech
    c. Impaired comprehension and little to no connected speech
    d. Spared comprehension with relatively fluent speech
    e. I don't know.
15. Which of the following are typically impaired in an individual with mixed non-fluent aphasia? Select all that apply.
    a. **Comprehension**
    b. **Fluency of speech output**
    c. Word repetition
    d. I don't know
16. The expressive speech of an individual with mixed non-fluent aphasia typically resembles the expressive speech of which other type of aphasia?
    a. Wernicke's aphasia
    b. Anomic aphasia
    c. Global aphasia
    d. **Broca's aphasia**
    e. I don't know.
17. Which of the following are typically impaired in an individual with anomic aphasia? Select all that apply.
    a. Comprehension
    b. Speech output
    c. Word repetition
    d. **Word retrieval**
    e. I don't know
18. Which of the following are typically true of an individual with anomic aphasia? Select all that apply.
    a. **Difficulty producing specific words**
    b. Produce non-fluent speech
    c. Difficulty understanding spoken language
    d. Difficulty answering yes/no questions
    e. I don't know