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Zachary Hooten
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A Comparison of Instructional Methods for Teaching APA Skills

A Thesis Submitted to the
Graduate Faculty of Jacksonville State University
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
with a Major in Applied Behavior Analysis

By

Zachary Aaron Hooten

Jacksonville, Alabama

May 3, 2024

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Zachary Aaron Hooten May 3, 2024

Abstract

Writing is highly important for college students, and they will need to conform to the formatting of the writing styles used in their classes. One style required of many students is the American Psychological Association (APA). Students often make errors when formatting references using APA Style. Although various instructional strategies have been used to teach these skills, some methods take a long time to achieve minimal increases or are cumbersome to implement in some learning environments. Behavioral skills training (BST) is an empirically supported method for teaching skills that involves providing the learner with written and verbal instructions, modeling, practice opportunities, and feedback until a predetermined mastery criterion is met. This teaching strategy is easily adaptable to most learning environments and individualized based on learner performance. However, no study has examined the use of BST to teach APA Style. Thus, the present study compared the effects of written instructions and BST on APA reference skills using a multiple baseline across behaviors design. Five undergraduate students were recruited as participants. They were asked to complete a demographics survey, a quiz, and reference tasks that assessed their ability to format a reference list item. Next, participants received written instructions that detailed the steps for correctly formatting a reference list item. If participants did not reach the mastery criterion in this condition, we conducted BST until participants could correctly format a reference list item at 90% correct responses or above. Participants completed a post-training and maintenance session approximately 1 week and 4 weeks after the initial session, respectively. Written instructions were effective at teaching most of the formatting steps. During the post-training and maintenance sessions, slight decreases in percentage correct were observed. The results of this study suggest

that less intensive methods, not more, are all that is necessary to teach APA referencing skills. We also discuss future areas for research.

ix., 47 pages

Acknowledgements

I cannot begin to thank my parents enough for always supporting me and pushing me to be the best person I could be. Without them, there is no chance I would be anywhere near where I currently am. I also want to thank my sisters for being my best friends in the world and another huge factor in motivating me to keep working hard towards my goal. Lastly, I want to thank all my professors at JSU for teaching me and always being there when I need them. I have enjoyed working with them and my classmates more than I could have ever imagined. I would like to single out Dr. Renda for being with me through every step of this process and helping to guide me on this journey.

Zachary Hooten

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A Comparison of Instructional Methods for Teaching APA Skills

The ability to write competently is an important skill for college students (Zhu, 2004). For many disciplines, effective writing could not only be a necessary skill, but a central one to their higher education (Monroe, 2003). Many classes, even those not focused on writing, will require that students are able to write on assignments and exams, and students will be evaluated on how effectively they can do this. Some universities require that students pass a writing competency exam or writing intensive course before being able to graduate (e.g., Albion College, n.d.; Midwestern State University of Texas, 2023; University of California, Davis, n.d.). Deficiencies with these skills could lead to decreases in academic performance and poor outcomes for future educational or career opportunities. For instance, writing samples are frequently requested by graduate programs when deciding admissions for incoming students (Michel et al., 2019). In addition, the inability to communicate effectively in writing is one of the top reasons new employees receive reprimands (Gardner, 2010). Unethical behavior is the top reason indicated by employers for firing new employees (Gardner, 2010). Unethical writing behaviors may include things like plagiarism, failing to properly cite sources, and inappropriate authorship. Given how crucial writing is for some students' college performance as well as their future goals, it is important that they understand and can properly use the writing styles their field requires.

American Psychological Association (APA) Style provides guidelines for written, scholarly communication, and is a common writing style for many disciplines. These guidelines provide writers, both professional and student, with a style they can use to present their ideas in a uniform and consistent manner (American Psychological Association, 2020). The Publication Manual of the APA (American Psychological Association, 2020) compiles these rules into a

singular place for readers and writers to quickly and easily navigate to find the answers to their questions. Along with the manual, the APA Style website (https://apastyle.apa.org/) is another easy-to-access resource that writers can consult to better understand the usage of this style. Using APA Style, "ideas flow logically, sources are credited appropriately, and papers are organized predictably and consistently" (American Psychological Association, 2020, p. xvii).

Two important components of APA Style are the in-text citations that appear throughout the text, and the reference list that appears at the end of the written work. Each in-text citation is used to properly credit the findings and ideas of others. Along with crediting others, properly citing sources allows writers to support the arguments they make in their papers. A reference list contains a list of all the sources that are cited throughout the paper, with each item in the list corresponding to an in-text citation. This provides readers with a section they can reference if they wish to further seek out these sources. Each reference list item consists of four main components: author(s), publication date, article title, and source (i.e., journal title, volume and issue number, page range, and digital object identifier [DOI]; American Psychological Association, 2020).

Although the Publication Manual of the APA (American Psychological Association, 2020) provides in-depth instruction and examples, college students still make errors when formatting reference lists. For instance, Mandernach et al. (2016) surveyed faculty and found that the most common APA-Style errors were those pertaining to the reference list and in-text citations. University instructors rate APA reference skills as highly important, but undergraduate performance is rated as needing improvement (Landrum, 2013). These errors are not just limited to undergraduate students. For example, Van Note Chism and Weerakoon (2012) found that graduate students often selected the wrong type of source or included unneeded information in a

reference list item. Thus, effective and efficient instructional strategies are needed to address these errors.

Various instructional methods have been used to teach APA reference skills to undergraduate and graduate students. Perhaps unsurprisingly, lecture-based methods (or lecture in combination with other components) have been used frequently (Clark & Murphy, 2021; Fallahi et al., 2006; Franz & Spitzer, 2006; Jorgensen & Marek, 2013; Luttrell et al., 2010; Smith & Eggleston, 2001). For instance, Franz and Spitzer (2006) compared lecture with an APA template to lecture using an APA checklist to teach referencing skills. Other studies have examined lecture with additional components such as manuscript correction (Smith and Eggleston, 2001), timely feedback and peer-to-peer editing (Fallahi et al., 2006), workshop components (Jorgensen & Marek, 2013), and adding a gaming element (Clark & Murphy, 2021).

Non-lecture-based methods to teach APA reference skills have also been used. For instance, Slezak and Fass (2017) used interteaching as an instructional strategy by providing a list of questions for students to answer before class, a lecture clarifying difficult topics, paired student discussion of the topic, and a record sheet where students indicate topics needing further clarification. Asynchronous teaching methods have also been used to teach APA skills. For instance, web-based computer-aided personalized system of instruction (WebCAPSI) is a commercially available online program that provides students with an individualized, online teaching method (e.g., Pear et al., 2011). Another method that has been used is behavioral instruction (Parry-Cruwys et al., 2022). Both computer-based methods involve multiple practice opportunities, mastery criteria, student-paced learning, and automatic, frequent feedback.

All of the aforementioned studies reported improved APA skills when compared to a comparison group or pre-training performance. However, some interventions spanned long periods of time (typically a semester) to find only marginal increases in performance. For instance, Luttrell et al. (2010) compared students completing an intensive writing course to students self-teaching APA skills to find that both groups improved with only a small difference between the means. The authors concluded that the intensive writing course was more effective. Although the differences in the score were statistically significant, they may not represent socially significant (or meaningful) changes. Slezak and Faas (2017) compared interteaching to traditional lecture, and although the interteaching group had a slightly greater increase in post-test scores, this did not generalize to a research report that was completed. In Fallahi et al. (2006), students wrote five papers using APA Style. Their intervention included peer-to-peer editing and timely instructor feedback. Although each paper gradually improved, especially reference skills, this study also took a semester to achieve these increases. These findings indicate a need for more efficient teaching methods that are generalizable and can create socially-significant changes in behavior.

The asynchronous methods (WebCAPSI and behavioral instruction) show they are effective methods at improving APA referencing skills. WebCAPSI has been compared with other teaching methods (e.g., weekly quizzes, extra paper assignments) and found to be more effective than those methods (for review, see Pear et al., 2011; e.g., Svenningsen, 2009). Likewise, Parry-Cruwys et al. (2022) showed large improvements at the individual level in APA reference formatting using behavioral instruction (a method similar to WebCAPSI). Although these asynchronous programs could be an effective course component, they are not easily amenable to all instructional settings (e.g., individual tutoring). An alternative, effective, and

efficient synchronous method to teach performance-based skills is behavioral skills training (BST).

BST is an empirically supported teaching method that is effective and efficient at teaching various skills in a wide range of populations (for review, see Kirkpatrick et al., 2019; Sun, 2022). This treatment package is composed of instruction, modeling, rehearsal, and feedback. First, written and verbal instructions are provided to the learner. Then, the trainer demonstrates the skill and answers questions. Next, the learner practices the skill and receives individualized performance feedback on correct and incorrect responses. Practice opportunities are repeated until the learner reaches a pre-determined mastery criterion.

No published study has examined the use of BST to teach APA reference skills. However, BST has been used with similar skills (formatting graphs, Kranak et al., 2019) providing support for its use here. Thus, the current study compared the effects of written instruction and BST on undergraduate students' APA reference skills.

This study had five conditions: pre-training, written instructions, BST, post-training, and maintenance. In pre-training, participants' APA reference skills were assessed without instruction. During the written instructions condition, participants received written instructions and their skills were assessed while using them. Next, the researcher provided instruction, modeling, and feedback while participants had rehearsal opportunities during BST. Participants returned approximately 1 week following the previous session for a post-training condition and approximately 4 weeks after post-training for the maintenance condition to assess how the skills maintained.

Methods

Participants

The participants in this study were five undergraduate students recruited from a lower-level undergraduate course at Jacksonville State University (JSU). Approval for this study was gained through JSU's Institutional Review Board (see Appendix A for approval letter). Students were eligible to participate if they were 18 years or older and were enrolled at JSU throughout the study. Before participation, students received a written informed consent form detailing the purpose, procedures, risks, and benefits of the study. Participants varied across demographics (see Table 1). Participants received a half point of extra credit for each session they attended, totaling 1.5 points if all three sessions were completed.

Table 1

Participant Demographics

Participant #	Demographics				
	Age	Gender	Ethnicity	Year	GPA Range
1	40	Female	Caucasian	Junior	3.7
2	23	Male	Caucasian	Senior	3.5-3.9*
3	20	Female	Caucasian/ Hispanic	Junior	2.7
4	18	Female	Caucasian	Freshman	4.0
5	20	Female	Caucasian	Sophomore	2.5

Note. Participant demographics from pre-training survey. GPA, grade point average

*Participant 2 provided a range for their GPA

Setting and Materials

Each session was conducted in an 11 ft by 10 ft, 8 in (3.4 m by 3.3 m) room. An Apple iPad (iPad mini 3) was used to record sessions to assess procedural integrity. The iPad was placed in the corner of the room, so both the primary observer and the participant were visible throughout the session. Participants sat at a desk perpendicular to the primary observer that had a computer monitor connected to a keyboard and mouse. On the primary observer's desk was a MacBook Air (macOS Sonoma Version 14.1.1) connected to the monitor, which allowed for screen mirroring. The laptop contained reference tasks (RTs; described below) presented through Microsoft Word for Mac (Version 16.78).

In some conditions, participants received printed written instructions. The written instructions detailed how to format a reference list item in APA Style and were separated into two sections (see Tables 2 and 3). Section 1 included instructions for formatting the author list, publication date, and article title. Section 2 included steps for formatting the journal title, volume and issue number, page range, and DOI. An example appeared at the end of both sets of instructions depicting a correctly formatted reference list item.

Table 2

Written Instructions for Section 1

Author list:

1. Authors' names appear in the order they appear in article
2. Comma after author's last name
3. Period after the first and middle initial of author
4. If multiple authors, comma following the last period after initials (when you get to the last author, proceed to step 6.)
5. Repeat steps 2, 3, and 4 for each additional author
6. The ampersand symbol (&) appears before the last author's last name.
7. No comma after last author's last initial

Publication year:

8. Year written in parentheses after the author list.
9. Period outside the parentheses.

Title:

10. Only the first word of the title is capitalized.
11. Proper nouns are capitalized.
12. Period after the title.

Smith, B. L., Hayes, J., & Dawn, R. (2018). The prevalence of sleep deprivation in Japan.

Note. First section of written instructions presented to participants.

Table 3

Written Instructions for Section 2

Journal:

13. All words are capitalized
14. Minor words are not capitalized (e.g., “and”, “the”, “of”; these words are still capitalized if they are the first word).
15. Italicized
16. Non-italicized comma at the end

Volume and Issue Number:

17. Italicize the volume number
18. Parentheses around issue number with no space between the volume and issue number.
19. The parentheses and issue number are not italicized.
20. Comma after the parenthesis

Page Range:

21. The beginning and end page numbers for the entire article are separated by an en dash
22. No spaces between page numbers and en dash
23. Period after the page range

DOI:

24. DOI is written as https://doi.org/
25. The remaining information is copied directly from the source
26. No period

The Journal of Psychological Science, *16*(25), 207–215. https://doi.org/10.1037/ppm0000185

Note. Second section of written instructions presented to participants. DOI, digital object identifier.

Participants completed RTs on Microsoft Word Documents. RTs contained all the information needed to create a fully formatted APA reference list item (for example, see Figure 1). At the top of each RT, information regarding a fictitious journal article was provided; the bottom portion provided a blank space for participants to format the information in APA Style.

Fifteen different RTs were created. To ensure consistency across the different RTs, the following elements were included in each: three authors, one of which had a middle initial, one proper noun in the article title, and one minor word (e.g., “the”, “of”, “and”) in the journal title.

Figure 1

Sample Reference Task (RT)

Note. DOI, digital object identifier.

Other materials included a pre-training questionnaire (see Appendix B), a seven-item pre- and post-training APA quiz (see Appendix C), a post-training social validity survey (see Appendix D), a timer, and a data collection sheet.

Data Collection

The primary observer was a graduate student at JSU with a Bachelor of Arts Degree in Psychology. All data were collected in person by the primary observer that had received training on procedural implementation and data collection. This training continued until the average

interobserver agreement (IOA) and procedural integrity scores were ≥ 90% across two consecutive sessions.

Data collection continued for 45 days (January 18 through March 1, 2024). The main dependent variable in this study was the percentage of correct responses on the RTs. The RTs were broken down into two sections of steps that corresponded to the two sections of written instructions, and these two sections were scored separately. Criteria for each step were created to allow the primary and secondary observers to have an objective method of scoring correct or incorrect responses (Appendix E). Using the screen-mirrored monitors, the observer was able to collect data in real time as the participant attempted an RT without being in an uncomfortable viewing position that could put additional pressure on the participant. Following each session, the observer reviewed the saved RT to check for data collection errors. Percent correct was calculated for each section by dividing the total number of steps completed correctly by the total number of steps and multiplying by 100. A paired-samples *t*-test was conducted to evaluate changes in percent correct on the pre- and post-training quizzes.

Interobserver Agreement and Procedural Integrity

IOA was assessed for 40% of each of the conditions using the completed RTs. A second observer scored correct and incorrect steps, and this was compared to the primary observer's data sheet. Trial-by-trial IOA was calculated by dividing the total number of agreements by the total number of agreements plus disagreements and multiplying by 100. Across all conditions, IOA was 99.17% (100% for pre-training, post-mastery, and maintenance; 99% for BST; 98% for written instruction and post-training).

Procedural integrity was also assessed for 40% of each of the conditions. A second observer watched the session recordings and scored the primary observer correct or incorrect on

their implementation of the procedure. A data sheet was created that contained all steps and a short description of the research procedure for each condition. Procedural integrity was scored by dividing the number of steps correctly completed by the total number of steps and multiplying by 100. Across conditions, procedural integrity was 99.17% (range, 95%–100%).

Procedure

A multiple baseline across behaviors design was used to evaluate pre-training APA reference skills and to compare written instructions and BST. The conditions in the study were pre-training, written instruction, BST, post-training, and maintenance. For each condition, participants completed one or more RTs. RTs were presented in the same order to all participants (depending on mastery [described below], some participants completed more RTs than others).

Pre-Training

A pre-training condition was conducted to assess baseline APA reference skills. Participants began by completing a pre-training demographic questionnaire and answered questions about their previous experiences using APA references (e.g., “In what ways have you learned to cite in APA Style?”, “How confident are you in your ability to correctly format APA references?”). Next, participants were given up to 5 min to complete a seven-item multiple-choice quiz on APA references. For all timed tasks in the study, the experimenter provided a verbal reminder when 1 min remained. Pre-training concluded with an RT. All RTs in this study had a 3-min time limit. No questions (if asked) were answered, and no instructions or performance feedback were given during pre-training. If participants did not know how to format a reference list item, they were given the option to progress to the next condition without completing the RT.

Written Instruction

After pre-training, participants received written instructions that outlined the steps needed to correctly format a reference list item. This condition was included to evaluate the effect of written instructions on formatting a reference list item. The presentation of written instructions for Sections 1 and 2 were staggered to evaluate internal validity. Thus, all participants initially received written instructions for Section 1 while Section 2 remained under pre-training conditions.

Participants were asked to read the instructions for Section 1 aloud. After, they were given 1 min to review the instructions silently before completing an RT. The participant had access to the instructions for Section 1 during the RT but did not receive any feedback on their performance; any questions (if asked) were not answered. On the first trial, participants did not have written instructions for Section 2 (i.e., Section 2 was under pre-training conditions); if a participant did not use all of the information to fully format the reference list item and time remained, the following prompt was given: "You have not used all the information, and you still have X amount of time. Would you like to attempt to use all the information before we move on?" This was done to further indicate to the participants they were expected to fully format a reference list item, even though they did not have all the instructions. Following one trial of written instructions for Section 1, Section 2 progressed from pre-training to written instructions. Participants were asked to read the instructions for Section 2 aloud and had up to 1 min to review them silently. During the second trial, participants completed an RT using the written instructions for Sections 1 and 2.

The written instruction condition continued until no increasing trend in percent correct from the preceding trial was observed. If percent correct in either section was 100%, one

additional trial was conducted. If percent correct was 100% on two consecutive trials, participants entered the post-mastery condition for that section (described below); in other words, the BST condition was skipped for Section 1 and/or Section 2 depending on percent correct.

Behavioral Skills Training

Following written instructions, the primary observer modeled the correct response. They paraphrased each step of the written instructions and provided additional information as needed (e.g., how to create an en dash, removing italics for the comma after the journal title) while completing an RT. The participant viewed this demonstration on the screen-mirrored monitor. Following the model, the participants were given the opportunity to ask questions. Next, the participants completed RTs and received performance feedback until the mastery criterion was met (≥ 90% correct responses) or until 60 min had passed. The participant had access to the written instructions provided in the previous condition. Participants received positive feedback on each step they correctly formatted (e.g., "Well done, that is exactly how you'd format the journal title!"), and corrective feedback for each step with errors. Corrective feedback consisted of what was wrong, why it was wrong, and how to correct it (e.g., "The page range is almost perfect, but you are still missing something. Instead of a hyphen you should use an en dash, which you can get by pressing "Alt" and the dash/minus button").

As in written instructions, BST implementation was staggered across Sections 1 and 2. The BST condition was skipped if the mastery criterion was achieved during the written instruction condition. If BST was skipped, or when performance was ≥ 90% for Section 1 in BST, participants progressed to the post-mastery condition (see below); Section 2 moved to the BST condition until the mastery criterion was met, which concluded the session.

Post-Mastery

If participants were at 100% correct during written instructions for Sections 1 and/or 2, or once the mastery criteria had been met during BST for Sections 1 or 2, participants entered the post-mastery condition. These trials were identical to those in the written instruction condition (i.e., access to written instructions, no performance feedback, no questions [if asked] were answered). The first session (pre-training to post-mastery) lasted an average of 38 min. At the end of the session, participants were allowed to keep the written instructions if they wanted.

Post-Training

All post-training sessions were conducted exactly 1 week after the initial session where these skills were assessed without immediate instruction. Participants completed a post-training quiz identical to the pre-training quiz except that answer choices and order were different. Next, participants completed one RT; they did not have access to written instructions and did not receive performance feedback. Finally, participants completed a BST social validity questionnaire. These sessions lasted an average of 10 min.

Maintenance

Approximately 4 weeks (range, 4 weeks – 5 weeks 6 days) following the post-training session, participants returned for one maintenance session lasting approximately 15 min. This session was identical to the post-training session, though the quiz and survey were excluded. This condition evaluated how well these skills maintain over time.

Results

Table 4 depicts the pre-training survey data for all participants. A little over half (*n* = 3; 60%) of participants reported they had not taken a class that required using APA Style. The most common teaching method participants reported having experienced was instructors providing links to websites on APA (*n* = 2; 40%). Participants also reported never having been taught how to cite in APA Style (*n* = 2; 40%). Surprisingly, no participant reported that an instructor directed them to use the APA manual. Participants' pre-training confidence in their citation abilities ranged from "0 - Not Confident" (*n* = 3; 60%) to "1 - Slightly Confident" (*n* = 2; 40%). All participants gave the same ranking to the importance of APA citation skills in college classes as "3 - Fairly Important". There was more variability in the importance of APA citation skills in careers. Two participants indicated "3 - Fairly Important" (40%), another two indicated "1 - Slightly Important" (40%), and one indicated "0 - Not Important" (20%).

Table 4

Pre-Training Survey Results

Question	Item Choices	Percent
Have any of your college classes required you to write using APA Style?	Yes	40%
	No	60%
In what ways have you learned to cite in APA Style?*	Instructor gave lecture on APA	20%
	Instructor provided written instructions or handouts on APA	20%
	Instructor provided links to websites about APA	40%
	Instructor directed you to use the APA manual	0%
	I taught myself	20%
	I have not been taught	40%
How confident are you in your ability to correctly format APA citations?	0 – Not confident	40%
	1 – Slightly Confident	60%
	2 – Moderately Confident	0%
	3 – Fairly Confident	0%
	4 – Extremely Confident	0%
How important do you think it is to be able to correctly format APA citations for classes?	0 – Not important	0%
	1 – Slightly important	0%
	2 – Moderately important	0%
	3 – Fairly important	100%
	4 – Extremely important	0%
How important do you think it is to be able to correctly format APA citations for your future career?	0 – Not important	20%
	1 – Slightly important	40%
	2 – Moderately important	0%
	3 – Fairly important	40%
	4 – Extremely important	0%

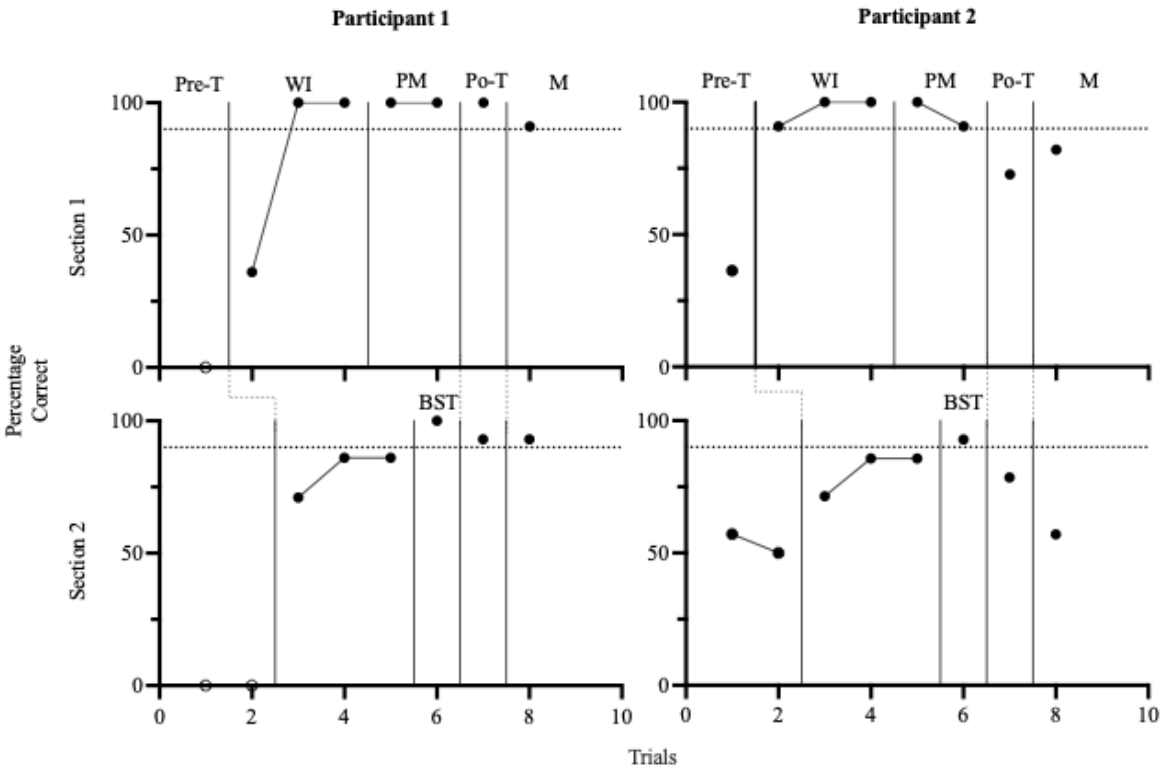
Note. Results from pre-training survey. APA, American Psychological Association

*Participants could have multiple responses on this question, explaining the percentage distribution being greater than 100%.

Figures 2, 3, and 4 depict all participants' data on correct completion of APA references across the RTs. The average percentage of correct completion of the RT for participants during pre-training for Sections 1 and 2 were low (*M*'s = 7.27% and 16.43%, respectively); however, only one participant attempted the RT during Section 1 and three attempted the RT for Section 2. During written instruction, there was a large increase in average percent correct for both Section 1 (*M* = 90.30%) and Section 2 (*M* = 76.19%). Of the five participants, four achieved the mastery criterion during written instruction for Section 1. The average percent correct during BST for Section 1 was similar to written instructions (*M* = 90.91%); however, only one participant experienced BST for Section 1. During Section 2, no participants met the mastery criterion during the written instructions condition. The average percent correct was high for this section (*M* = 95.24%). Post-mastery averages for percent correct were still at a high level for Section 1 (*M* = 97.27%), and no participant encountered post-mastery for Section 2. When participants returned for the post-training session, the averages were similar to those in written instructions for both Section 1 (*M* = 90.91%) and Section 2 (*M* = 76.79%). During the maintenance session, percent correct decreased for Section 1 (*M* = 84.09%) and stayed the same in Section 2 (*M* = 76.79%).

Figure 2

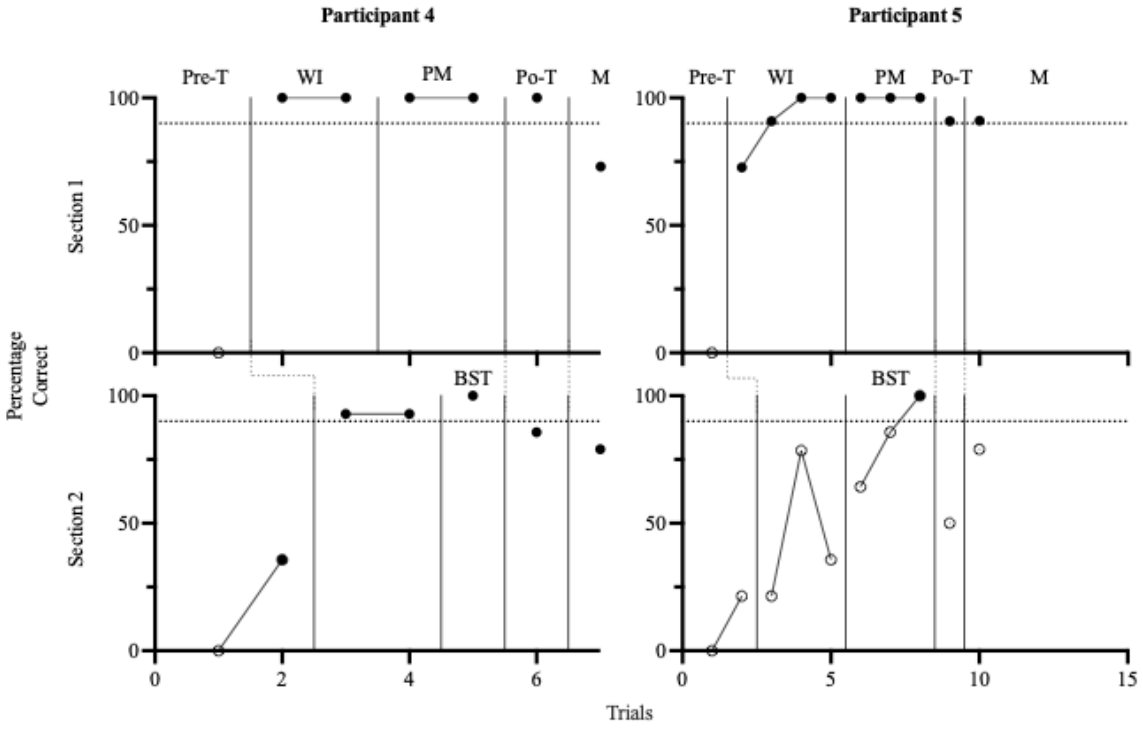
Participant 1 & 2 RT Percent Correct



Note. Percent of APA steps completed correctly for Section 1 (top two graphs) and Section 2 (bottom two graphs) during pre-training (Pre-T), written instruction (WI), behavioral skills training (BST), post-mastery (PM), post-training (Po-T), and maintenance (M). Open data points denote trials in which participants did not attempt the task; closed data points denote attempted trials. The dotted lines indicate the mastery criterion.

Figure 3

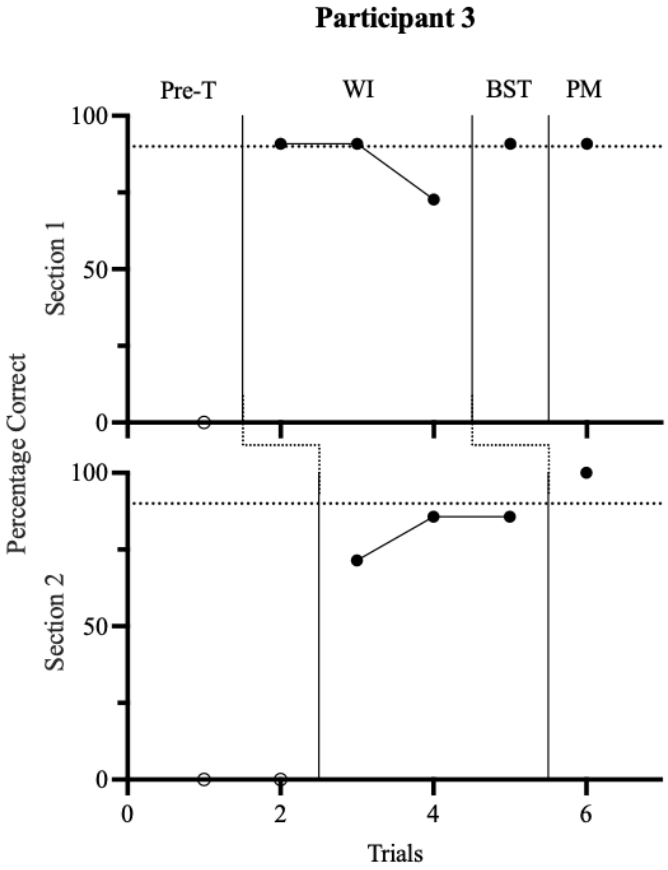
Participant 4 & 5 RT Percent Correct



Note. Percent of APA steps completed correctly for Section 1 (top two graphs) and Section 2 (bottom two graphs) during pre-training (Pre-T), written instruction (WI), behavioral skills training (BST), post-mastery (PM), post-training (Po-T), and maintenance (M). Open data points denote trials where participants did not attempt the task or did not complete the RT during the allotted time; closed data points denote attempted trials. The dotted lines indicate the mastery criterion.

Figure 4

Participant 3 RT Percent Correct

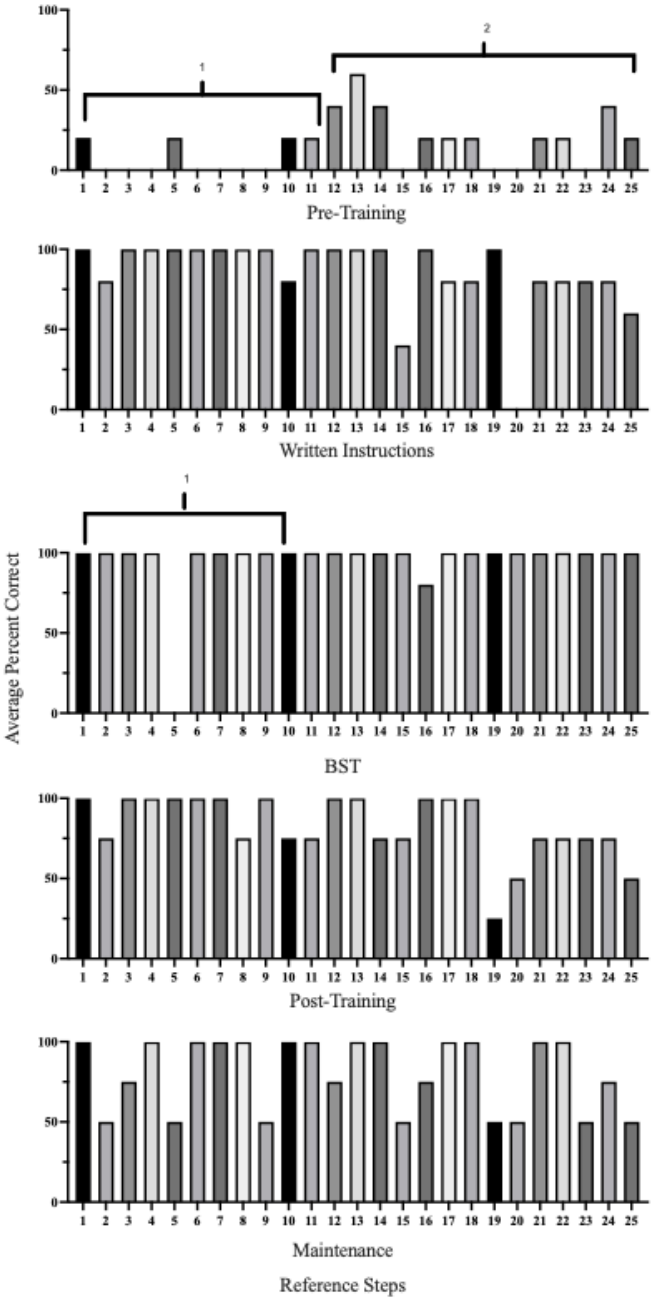


Note. Percent of APA steps completed correctly for Section 1 (top graph) and Section 2 (bottom graph) during pre-training (Pre-T), written instruction (WI), behavioral skills training (BST), and post-mastery (PM). Open data points denote trials where the participant did not attempt the task; closed data points denote attempted trials. The dotted lines indicate the mastery criteria. Participant 3 did not return for the post-training session.

Figure 5 depicts the average percent of correct responses across steps for all conditions. Although errors made varied between participants, there were some similarities between them. Errors were considered to be commonly occurring if the average percent correct was at or below 50% with two or more participants attempting a particular step. Average percent correct during pre-training was low and few participants attempted the RT in this condition. Average percent correct was much higher during written instructions and common errors were more apparent. One of these is Step 15 involving a non-italicized comma appearing at the end of a journal title. Most participants did not properly format the comma until the introduction of BST. Another is Step 20, which concerns the placement of an en dash between the page range. The BST average was high and none of the steps met the qualifications for commonly being wrong. There were more commonly occurring errors during post-training than written instructions. Performance on Step 20, which was also low during written instructions, had improved in post-training, but was still low. Step 25 was another low average, and it had to do with not including a period at the end of the DOI. The step participants most commonly erred on was Step 19 and it included inserting a comma outside of the parentheses that surround the issue number.

Figure 5

Average Percent Correct Across Steps



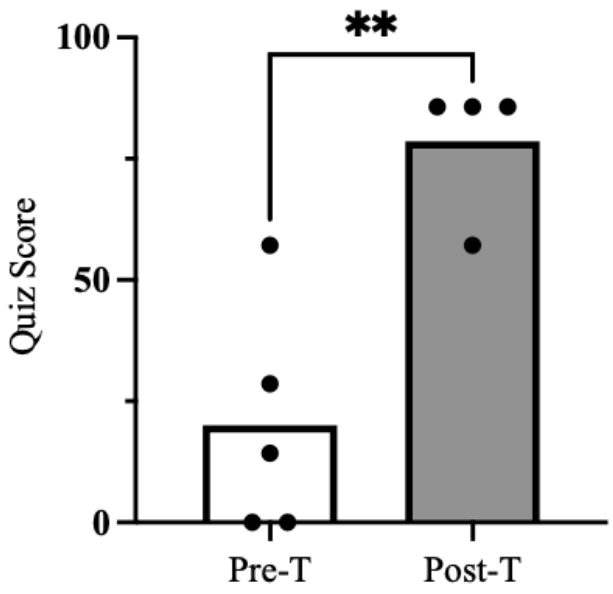
Note. Average percent correct across steps for each condition. [1] indicates sections where only one participant attempted the reference task; [2] indicates when three participants attempted the reference task. Reference tasks in all other conditions were attempted by all participants with the

exception that that Participant 3 did not attend the post-training and maintenance sessions. BST, behavioral skills training. Steps range from both Section 1 and 2.

Figure 6 depicts percentage of correct responses on the pre-training and post-training quizzes. There was a significant increase from in quiz scores from pre- and post-training ($t(3) = 5.961$, $p < 0.01$).

Figure 6

Pre-Training & Post-Training Quiz Scores



Note. Pre-training and post-training quiz scores for all participants. Bars indicate the mean score for the quiz; closed circles represent the individuals scores of participants. Participant 3 did not return for post-training. ** $p > .01$

Table 5 depicts the post-training survey data. The majority of participants indicated that they strongly agreed that BST was a more effective teaching method than others they had experienced (*n* = 3; 75%), though one participant indicated they strongly disagreed (25%). Similarly, most participants reported that they would highly recommend BST be used by other students to learn APA skills (*n* = 3; 75%) with one participant highly discouraging it (25%). Participants indicated that they felt "3 - Fairly Confident" in their abilities to correctly format APA references (*n* = 2; 50%). The other two participants indicated one score above (4 – Extremely Confident) and one below (2 – Somewhat Confident). Participants strongly agreed that BST had increased their confidence in their APA referencing skills (*n* = 3; 75%), with the other participant indicating they agreed (25%).

Table 5

Post-Training Survey Results

Question	Item Choice	Percentage (%)
Did the model and verbal feedback help you to learn American Psychological Association (APA) citations more effectively compared to other teaching methods you have experienced?	Strongly Disagree	25%
	Disagree	0%
	Neither Agree nor Disagree	0%
	Agree	0%
	Strongly Agree	75%
Would you recommend other students use modeling and verbal feedback to learn APA citation skills?	Highly Discourage	25%
	Discourage	0%
	Neutral	0%
	Recommend	0%
	Highly Recommend	75%
How confident do you feel in your ability to correctly format APA citations after learning using modeling and verbal feedback?	0 – Not Confident	0%
	1 – Slightly Confident	0%
	2 – Somewhat Confident	25%
	3 – Fairly Confident	50%
	4 – Extremely Confident	25%
Modeling and verbal feedback has increased my confidence in my ability to correctly format APA citations.	Strongly Disagree	0%
	Disagree	0%
	Neither Agree nor Disagree	0%
	Agree	25%
	Strongly Agree	75%

Note. Results from post-training survey. APA, American Psychological Association

Discussion

The present study sought to compare the effects of written instructions and BST on students' learning of APA reference skills. For almost all participants, BST was not necessary for learning the first half (Section 1 in the current study) of an APA reference (only one participant encountered this research condition). On the other hand, BST was needed by all five participants to reach mastery on the second half of an APA reference (Section 2 in the current study), though it was only needed to clarify a few of the steps. All participants' quiz scores increased between pre- and post-training, and when compared to pre-training, the percent correct of all participants' RTs was higher when they returned for the post-training session. Although participants' maintenance scores decreased slightly or stayed the same from post-training, they were still higher than pre-training scores.

The findings from this study suggest that for many participants, written instructions are sufficient for teaching Section 1 of an APA reference list item. This is supported by the fact that out of five participants, BST was only necessary for one participant in Section 1, with the rest of the participants skipping it to move to post-mastery. For Participants 1, 2, and 5, very few trials with the written instructions were needed before they reached the mastery criteria, while for Participant 4, they immediately reached 100% on the first trial with written instructions. These findings were surprising due to the author's personal experiences with trying to teach these skills, as written instructions in isolation are typically not sufficient. A likely reason for participants performing at a higher level than anticipated is the added pressure participants felt from the primary observer that they would not normally experience in the classroom.

Although not as high as percent correct in Section 1, the near mastery results for most participants during written instructions suggests that they may be sufficient for Section 2 as well,

with some alterations. This is supported by the fact that some of the common errors in Section 2, such as Step 20, were remedied after the model and verbal instructions were provided during BST. It is possible that with these additional details being included in the written instructions, participants would not have made these errors and would not have required BST for Section 2 either. Additionally, most participants only needed one session of BST before reaching the mastery criteria, further supporting that additional information in written instructions may have been sufficient for most. The necessity to determine if written instructions are sufficient for teaching Section 2 of a reference list item is an area of future research discussed below.

For the majority of participants, percent correct maintained between BST and post-mastery with the exception of Participant 2 whose percent correct decreased by a single step. Participants still had access to the written instructions in this condition and had just received feedback on their formatting, so it makes sense that percent correct would stay near the same level. All participants who returned for post-training had a decrease in their percent correct at varying levels. This decrease in score can be explained by the weeklong gap between the first session and the post-training session. The only instructions participants had access to during this gap were the written instructions from the first session if they decided to keep them. Participants could not use these instructions during the post-training session. When they returned, they were asked to complete an RT without instruction or feedback. For the majority of participants, their scores stayed the same or decreased slightly from post-training when they returned for the maintenance session. Not all participant scores decreased, such as Participant 2 who had a slight increase in their score in Section 1 (9.09%), and Participant 5 who had a substantial increase in Section 2 (28.57%). No new instructions or feedback were given in this condition either, suggesting that these increases might result from one section generalizing more for a participant

while the other does not. In this case, Section 1 had greater generalization for Participant 2 and Section 2 for Participant 5. Another reason for this increase for Participant 5, who initially struggled to complete an RT within the time limit during pre-training, could be because they had adapted to the time limit and were now better able to work under its constraints. Written instructions appear to be effective at teaching APA referencing skills in a short period of time to an acceptable level, but the maintenance of these skills, in the absence of access to written instructions, is questionable. An interesting area for future research would be to use written instructions or the APA manual as something to check their work against, rather than as a teaching component.

The results from this study are interesting because written instructions appear to be sufficient for teaching APA referencing skills. This leaves the question of why students who do use these instructions continue to make errors when formatting APA references. One possible reason for this is that the RTs used in the current study were less complex than formatting a full reference list. Although participants in the study were only asked to format a single item, a student in the classroom might be required to format an entire reference list following APA protocol for alphabetizing the list and using a hanging indent. Another factor that decreased the complexity of the task was only asking participants to format journal references list items, whereas the genre of reference list items in an actual paper may vary (e.g., edited book chapters, online resources). It is also likely that participants were more motivated to perform well in the presence of the primary observer, unlike in the normal environment where they would be working on their own with no one observing them.

These results are also interesting due to previous findings in the literature which contrast with those from the current study. Some studies required more intensive methods to reach similar

levels of correct APA formatting to those found here (Jorgensen & Marek, 2013; Luttrell et al., 2010; Slezak & Faas, 2017). Jorgensen and Marek (2013) used a workshop to improve many different APA skill areas, one of which was APA references. The students that completed the workshops were found to have greater increases in skills than the handout-only group that did not attend the workshop. These findings suggest that more intensive methods are necessary to achieve these increases, whereas the current study suggests that a simple and common method is at least partly sufficient. The contradicting results obtained by the present study and past research may be due to methodological differences (e.g., task complexity discussed above). Franz and Spitzer (2006) compared two forms of written instructions (checklist and template) to each other to teach APA references, and both were found to be effective, though the template was slightly more so. They decided to replicate their study, but instead compared the template and checklist in combination to the template alone and found that teaching using both was most effective. This study supports the findings of the current research and suggests that multiple forms of written instructions may increase the efficiency of learning with this method.

This study, like most, had its share of limitations. One such limitation was that Sections 1 and 2 were presented in the same order to participants. This was done to follow the more natural flow of writing a reference list item. By not counterbalancing, the possibility of order effects influencing data increases. Future research could counterbalance conditions to remedy this. Another limitation in the current study is the 3-min time limit to complete RTs. Participant 5 needed multiple attempts before being able to fully format the reference list item in the time limit. Longer time periods to complete the task would decrease this factor from affecting responding.

The method of scoring responses was another limitation of the current study as the method was not as precise as it could have been. For instance, spacing errors were not counted as incorrect. For example, "Smith, A.B." was not marked as incorrect even though there should be a space between the first period and the author's last initial. Additionally, steps were not marked as incorrect if they had doubled punctuation marks (e.g., "(2010).."). Adding words that were not present originally was another error that was ignored (e.g., adding "The" to "Journal of Historic Research"). These types of minor errors were ignored as it would have made within-session data collection cumbersome. Another reason we chose to ignore these errors is because of a precedent set by Parry-Cruwys et al. (2022) who only scored errors of omission (i.e., missing components) rather than errors of commission (i.e., adding components that were unnecessary). This occasionally led to an attempt being scored as perfect even though it contained errors within the reference. There would typically only be a single error that was ignored leading to the appearance of a perfectly completed RT, as opposed to multiple errors that masked a poor performance as great. That is, participants' "true" scores were not being hidden by these unscored errors because the scores they would have gotten had the additional errors been scored, were not substantially different from the score they actually received.

Our short pre-training condition is another limitation that should be discussed. To keep session times to a reasonable length, only one pre-training session was conducted for Section 1 and two for Section 2. Although only one participant attempted the RT during pre-training for Section 1, it is possible they would have had an increase in percent correct without the introduction of written instructions. Interpretation of Section 2 is also limited because two participants showed an increasing trend on the second pre-training trial. By ending the pre-training phase without achieving stable responding, it is difficult to solely attribute the increases

in percent correct during written instruction to the introduction of these instructions. This decreases the experimental control of this study and suggests that participants responding could have been improving, at least partly, due to practice effects rather than the instructions provided to them. Although practice effects likely contributed, the substantial increases in percent correct between pre-training and the introduction of written instructions suggests that it is even more likely a combination of the instructions and practice effects, rather than just one or the other. Practice effects could not be assessed in Section 1 due to a single trial, but they could be in Section 2. There is some evidence in Section 2 that practice effects are occurring, but this is conflated with the introduction of written instructions in Section 1. Because these cannot be separated to assess them individually, it is difficult to attribute increases to either. Future research could extend the pre-training condition to allow responding to stabilize before moving on. Increases in percent correct that would have occurred naturally would be accounted for and changes caused by introducing written instructions would be clearer.

Perhaps one of the most important areas for future research to investigate is if written instructions alone are sufficient for teaching the formatting of an entire reference list item with the additional information from BST being provided. There is strong evidence that they are in the Section 1 results, and although the evidence in Section 2 is weaker, the high percent correct during it suggests that written instructions may be sufficient. With little evidence provided for the necessity of BST for teaching APA references, it is probably better to evaluate written instructions on their own or compare them to another traditional teaching method (e.g., lecture) than to compare them to BST again. Increasing the complexity of the tasks and the written instructions would be interesting as well, because it could reveal if more complex tasks require more complex instructions, or if instructions are sufficient no matter the complexity of the task.

Another interesting consideration for future research is whether written instructions are sufficient for teaching other APA skills such as in-text citations or formatting numbers. Landrum (2013) identified other elements of APA Style that students are deficit in, so investigating how written instructions effect students' acquisition of these skills could be beneficial. Although the APA manual is an appropriate resource for guiding students, it could be cumbersome for individuals new to writing in this style, so having a more condensed form of these instructions could be advantageous.

Another area future research could investigate that the current study did not is how these skills generalize. Does learning one genre of APA references with written instructions generalize to other genres? Perhaps the most interesting area of generalization to study is if teaching APA references with written instructions allow students to generalize these skills to future assignments in different contexts.

Although additional research is necessary to determine if written instructions are sufficient for teaching students to format APA references, the findings from this study support the effectiveness of written instructions alone to teach this skill, at least partially. Most participants were able to reach mastery with written instructions alone in Section 1, and most individual percent correct was near mastery in Section 2. The majority of participants reported that they found that BST was a more effective method than other methods they had encountered, and all participants reported that it increased their confidence in their skills to varying degrees; these same questions were not asked of written instructions, but it is possible participants would have found them to also be a socially valid teaching method. All in all, written instructions appear to be an effective method for teaching APA referencing skills and further refinement could change how these skills are taught in the future.

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Appendix A

Approval Letter

INSTITUTIONAL REVIEW BOARD
JACKSONVILLE STATE UNIVERSITY

Institutional Review Board for the Protection of Human Subjects in Research
203 Angle Hall
700 Pelham Road North
Jacksonville, AL 36265-1602

October 13, 2023

Zachary Hooten
Jacksonville State University
Jacksonville, AL 36265

Dear Zachary:

Your protocol for the project titled "A Comparison of Instructional Methods for Teaching APA Skills" protocol number 10132023-02, has been approved by the JSU Institutional Review Board for the Protection of Human Subjects in Research (IRB).

If your research deviates from that listed in the protocol, please notify me immediately. One year from the date of this approval letter, please send me a progress report of your research project.

Best wishes for a successful research project.

Sincerely,

Sarah Donley
Human Protections Administrator, Institutional Review Board

Appendix B

Pre-Training Questionnaire

1. Age: _____

2. What is your year in college?

    - ○ Freshman
    - ○ Sophomore
    - ○ Junior
    - ○ Senior

3. What is your major? _____

4. How do you describe yourself?

    - ○ Male
    - ○ Female
    - ○ Transgender
    - ○ Non-binary/non-conforming
    - ○ Prefer not to say
    - ○ Other: _____

5. What is your ethnicity?

    - ○ White/Caucasian
    - ○ Hispanic/Latino
    - ○ Black/African American
    - ○ Asian
    - ○ Native American
    - ○ Prefer not to say
    - ○ Other: _____

6. What is your current college Grade Point Average (GPA)? _____

7. Have any of your college classes required you to write using APA style?
   - ○ Yes
   - ○ No

8. In what ways have you learned to cite in APA style? (select all that apply)

   - ☐ An instructor has given a lecture describing how to cite in APA style.
   - ☐ An instructor has provided written instructions, templates, and/or handouts on how to cite in APA style.
   - ☐ An instructor has provided links to websites on how to cite in APA style.
   - ☐ An instructor has directed me to read/use the Publication Manual of the American Psychological Association.
   - ☐ I have taught myself how to cite in APA style (e.g., I have found my own resources).
   - ☐ I have not been taught how to cite in APA style, and I have not taught myself.

9. How confident are you in your ability to correctly format APA citations?
   - ○ 0 - Not Confident at all
   - ○ 1 - Slightly Confident
   - ○ 2 - Moderately Confident
   - ○ 3 - Fairly Confident
   - ○ 4 - Extremely Confident

10. How important do you think it is to be able to correctly format APA citations for classes?

- ○ 0 - Not Important
- ○ 1 - Slightly Important
- ○ 2 - Moderately Important
- ○ 3 - Fairly Important
- ○ 4 - Extremely Important

11. How important do you think it is to be able to correctly format APA citations for your future career?

- ○ 0 - Not Important
- ○ 1 - Slightly Important
- ○ 2 - Moderately Important
- ○ 3 - Fairly Important
- ○ 4 - Extremely Important

Appendix C

Pre- & Post-Training Quiz

Instructions: For each question, circle the answer that is most correct.

1. Which of the following options is correctly formatted for a reference list?

    a) Ryan, A. Johnson, L. & Higgins. B.
    b) Ryan, A., Johnson, L., & Higgins, B.
    c) Ryan, A, Johnson, L, & Higgins, B.
    d) Ryan, A., Johnson, L., and Higgins, B.

2. Which journal title is correctly formatted for a reference list?

    a) *Journal of Clinical Psychology*.
    b) Journal of Clinical Psychology,
    c) Journal of Clinical Psychology.
    d) *Journal of Clinical Psychology*,

3. Which of these is a correctly formatted DOI?

    a) https://doi.org/10.2745/pb.5504.
    b) DOI: 10.2745/pb.5504
    c) https://doi.org/10.2745/pb.5504
    d) Digital Object Identifier – 10.2745/pb.5504.

4. Which of the following is a correctly formatted volume and issue number in a reference list?

    a) *12*(3),
    b) *12* & 3,
    c) *12* (3),
    d) *12* (3).

5. Which of the following is a correctly formatted article title?

    a) A Literature Review on Trauma Therapy in Ireland.
    b) A literature review on trauma therapy in Ireland.
    c) *A Literature Review on Trauma Therapy in Ireland.*
    d) *A literature review on trauma therapy in Ireland.*

6. How does the publication date appear in a reference list?

    a) 2018.
    b) (October 7, 2018).
    c) 10/7/2018.
    d) (2018).

7. How should the page range appear in a reference list?

    a) Pgs: 190 – 201.
    b) 190–201.
    c) 190–201 pgs.
    d) P#: 190 – 201

Instructions: For each question, circle the answer that is most correct.

1. How does the publication date appear in a reference list?
   a) (August 1, 2015).
   b) (2015).
   c) 2015.
   d) 8/1/2015.

2. Which of the following is a correctly formatted article title?

   a) *An examination of shoe design at nike.*
   b) An Examination of Shoe Design at Nike.
   c) *An Examination of Shoe Design at Nike.*
   d) An examination of shoe design at Nike.

3. Which journal title is correctly formatted for a reference list?

   a) Journal of Experimental Psychology.
   b) Journal of Experimental Psychology,
   c) *Journal of Experimental Psychology,*
   d) *Journal of Experimental Psychology*.

4. How should the page range appear in a reference list?

   a) 345–367.
   b) Pgs: 345–367.
   c) P#: 345–367.
   d) 345–367 pgs.

5. Which of these is a correctly formatted DOI?

   a) Digital Object Identifier – 10.3758/xr.7802
   b) https://doi.org/10.3758/xr.7802.
   c) DOI: 10.3758/xr.7802.
   d) https://doi.org/10.3758/xr.7802

6. Which of the following options is correctly formatted for a reference list?

    a) Hilton, L. James, M. & Harrison, N.
    b) Hilton, L James, M & Harrison, N.
    c) Hilton, L., James, M., & Harrison, N.
    d) Hilton, L., James, M., and Harrison, N.

7. Which of the following is a correctly formatted volume and issue number in a reference list?

    a) *14* & 9,
    b) *14*(9),
    c) *14* (9),
    d) *14* (9).

Appendix D

Post-Training Social Validity Survey

1. Did the model and verbal feedback help you to learn American Psychological Association (APA) citations more effectively compared to other teaching methods you have experienced?
    - ○ Strongly Disagree
    - ○ Disagree
    - ○ Neither Agree nor Disagree
    - ○ Agree
    - ○ Strongly Agree

2. Would you recommend other students use modeling and verbal feedback to learn APA citation skills?
    - ○ Highly Discourage
    - ○ Discourage
    - ○ Neutral
    - ○ Recommend
    - ○ Highly Recommend

3. How confident do you feel in your ability to correctly format APA citations after learning using modeling and verbal feedback?
    - ○ 0 – Not Confident
    - ○ 1 - Slightly Confident
    - ○ 2 - Somewhat Confident
    - ○ 3 - Fairly Confident
    - ○ 4 - Extremely Confident

4. Modeling and verbal feedback has increased my confidence in my ability to correctly format APA citations.
    - ○ Strongly Disagree
    - ○ Disagree
    - ○ Neither Agree nor Disagree
    - ○ Agree
    - ○ Strongly Agree

Appendix E

APA Reference List Item Steps Rationale

Reference List	Rationale
1. Authors' Names are in Correct Order	**Authors' names appear in the same order as on the list**
2. Comma After Author's Last Name	**A comma appears after all the authors' last names**
3. Period After Author's Initials	**Period After Author's Initials**
4. Comma After the Last Initial Period	**Comma After the Last Initial Period**
5. "&" Symbol Appears Before the Third Author	**"&" symbol between second-to-last and last author**
6. No Comma After Last Author's Initial	**Only a period appears after the initial**
7. Year Written in Parentheses	**Closed parentheses appear around the year**
8. Period Outside of Parentheses	**A period appears outside the parentheses**
9. Title is Sentence Case	**All words lowercase except first word**
10. Proper Nouns Capitalized	**The proper noun is capitalized**
11. Period After Title	**A period appears after the title**
12. All Words are Uppercase	**All words are uppercase**
13. Minor Words are Lowercase	**Minor words left lowercase**
14. Source is Italicized	**The source is written in italics**
15. Non-Italicized Comma at the End	**A comma appears at the end which is not italicized**
16. Italicized Volume Number	**Volume # is written in italics**

17. Parentheses Around Issue Number with No Space	**Issue # appears in closed parentheses and no space between the parentheses and volume #**
18. Parentheses and Issue Number Non-Italicized	**Written with italics turned off**
19. Comma Outside of Parentheses	**Comma is outside of the parentheses**
20. Pages Separated by En Dash	**En dash appears between page range**
21. No Space Between Pages and En Dash	**No spaces**
22. Period After Page Range	**Period appears at the end**
23. https://doi.org/...	**First half written exactly like this**
24. Second Half of DOI Copied	**Second half copied exactly**
25. No Period After DOI	**No period at the end**