

## APA Style Referencing: A Web-Based Module

Lynda Hoang  
University of Hawaii, U.S.A.  
[lyndah@hawaii.edu](mailto:lyndah@hawaii.edu)

**Abstract:** This web-based instructional module on APA style referencing allowed students easy access to learning a skill needed for academic success. It took into account multimedia learning theories and known problems such as cognitive overload, working memory capacity, modality principle, and individual differences. Individual differences in prior knowledge, content preference, and working memory capacity were considered during the design of the module which was created using an instructional design model. Findings from the study show that APA instruction via hypermedia was effective in increasing posttest scores from pretest scores. Also, survey results showed students found the module engaging, clear, and relevant. Research findings from this project will be useful to the academic community in selecting instructional design strategies, instructional design models, and types of media when creating instruction so that it will be more effective for learners.

### Introduction

When asked the question, “Do you enjoy using APA style formatting?” all students out of a class of 12 University of Hawaii graduate students replied, “No.” A web-based instructional module on APA style referencing took this into consideration and provided an animated, narrated, interactive tutorial for students who conduct research at the College of Education at the University of Hawaii at Manoa. Existing resources for APA style such as the official manual and other software are tedious, expensive, or not up to date, making it necessary for students to have knowledge of APA even when using these resources. Delivering APA style training on the web gave students motivation and accessibility to learning a tedious skill needed for academic success.

Many students who are not proficient with APA citation avoid using databases to find articles so that they may avoid the problem of not knowing how to cite it correctly and instead rely heavily on search engines such as Google. Relying heavily on search engines limits the kind and quality of articles one has access to, so this may affect academic research (Lewis, 2008). The web-based module helped students acquire skills to write in APA style and will eventually help them produce better quality research, based on a much wider range of sources. The research students produce will be less skewed, which in turn, will be used by other researchers. This benefits both students and the academic community as a whole.

The module took into account multimedia learning theories and known problems such as cognitive overload, working memory capacity (WMC), and dual task paradigm.

Individual differences in prior knowledge, content preference, and working memory capacity were also be considered during the design of the module.

## **Background**

The module focused on instruction for electronic resources, since they are increasing in use due to convenience. Also, the newly released 6<sup>th</sup> edition of the APA manual includes new guidelines for referencing electronic resources, which many are unfamiliar with. Previous guidelines for referencing electronic resources were unclear due to the absence of Digital Object Identifiers (Lewis, 2008).

Web-based modules can make learning engaging and interactive. “A good design will allow students to (1) visualize difficult and naturally dynamic concepts, (2) promote active learning, problem-solving, and critical thinking with interactive simulations and virtual environments, (3) interact with the content with self-quizzes, and (4) access content anytime, anywhere, at any pace” (Huang, 2005, p. 224). Furthermore, learning theory such as individual styles of learning were incorporated into the design of the module. Animation stimulated visual learners, narration appealed to auditory learners, and interactive activities accounted for kinesthetic learners. However, care was taken to not overwhelm the learner with too many choices, since animations can present information too quickly and be too complicated for learners to grasp (Chandler, 2009). Other instructional design theories such as individual differences in working memory capacity were incorporated into the module's design as well. “Low WMC students will have difficulty learning from complex multimedia tutorials and segmentation is one strategy for mediating this difficulty” (Lusk, Evans, Jeffrey, Palmer, Wikstrom, & Doolittle, 2009, p.648). The module segmented information into manageable chunks. Two short videos, each three to four minutes in length, were developed to present the content. The APA style reference form provided was limited to seven components to assist the audience in retaining the information.

This APA module follows the trend toward web-based automation. It was kept simple because its primary purpose is to inform how to cite references without burdening the author. Also, taking into account findings from Chandler (2009) and Gerjets, Scheiter, Opfermann, Hesse, & Eysink (2009), information should be presented in a way that is conducive to learning and the user interface is not so complicated that it impedes learning. It was also interactive, visual, and auditory to appeal to different learning styles. Content was separated into segments to account for learners with different WMC.

## **Methodology**

Content consisted of the new guidelines for electronic resource referencing from the newly updated 6<sup>th</sup> edition of the APA manual. Learners were tested on whether they could accurately distinguish APA style references through the following steps. First, the learner is assumed to have entry level skills that enable the learner to identify the components (which part is the author, year, title of periodical, volume/issue, page, DOI or

URL), The instruction was presented via two short videos made with Jing and Microsoft PowerPoint. Then, the learners were directed to an interactive Adobe Flash tutorial where they were given a set of electronic periodical reference data, and to arrange the components in the correct sequence. The practice test allowed them to practice choosing the correct format (punctuation, font, style) for APA references. The terminal objective was tested with a multiple choice question in which the learner combines the previous skills learned to accurately distinguish a general electronic periodical reference according to the 6<sup>th</sup> edition APA manual. The tests were made using College of Education (COE) Survey tool and provided immediate feedback for any questions the participants may have answered incorrectly. Each question was worth one point and pre-test, embedded test, and post-test scores were compared to check for effectiveness of instruction and retention. The entire module took about one hour to complete.

The module's simple instructional design module was created using the ADDIE model (analysis, design, development, implementation, and evaluation) and Gagne's nine events of instruction (Gagne, Wager, Golas, & Keller, 2005). Starting with a video on examples of proper APA style referencing, the video was used to gain attention by showing how electronic citation tools sometimes are inaccurate and unreliable. The video was designed to engage learners and enhance retention with its animation. It also featured narration to appeal to auditory as well as visual learners.

A second video followed to segment content into manageable, three to four minute chunks. Both videos had a table of contents slide and review slide to inform learners of the objective and enhance retention. An interactive activity made on Adobe Flash followed, in which the learners are required to drag and drop the correct components into the correct sequence. This gave learners a chance to practice what they learned and motivate learning. A practice test followed, in which learners were given immediate feedback on their answer choices. Learners took a pre-test, practice test, and post-test (all with parallel test items) hosted on a webpage.

Mayer's instructional design theory (Mayer, 2008) was incorporated into the design of the module. Of the 10 principles, five are aimed at reducing extraneous processing (coherence principle, signaling principle, redundancy principle, spatial contiguity, temporal contiguity), which wastes precious cognitive capacity on things that the learner is not aiming to learn. The module was created to reduce extraneous material, highlight essential material, avoid too much redundancy, and avoid portraying the same information simultaneously in visual and auditory media. The next three principles were aimed at making complex material manageable (segmenting, pretraining, and modality). The module addressed these principles by presenting animation in learner-paced segments and previewing vocabulary such as the DOI. The last two principles (multimedia and personalization) help learners understand and use the cognitive capacity they have. Using the multimedia principle, words and pictures and color-coded text were presented rather than words alone to help learners build connections between the verbal and pictorial representations of material. Finally, in accordance to personalization principle, the module presented information conversationally rather than formally.

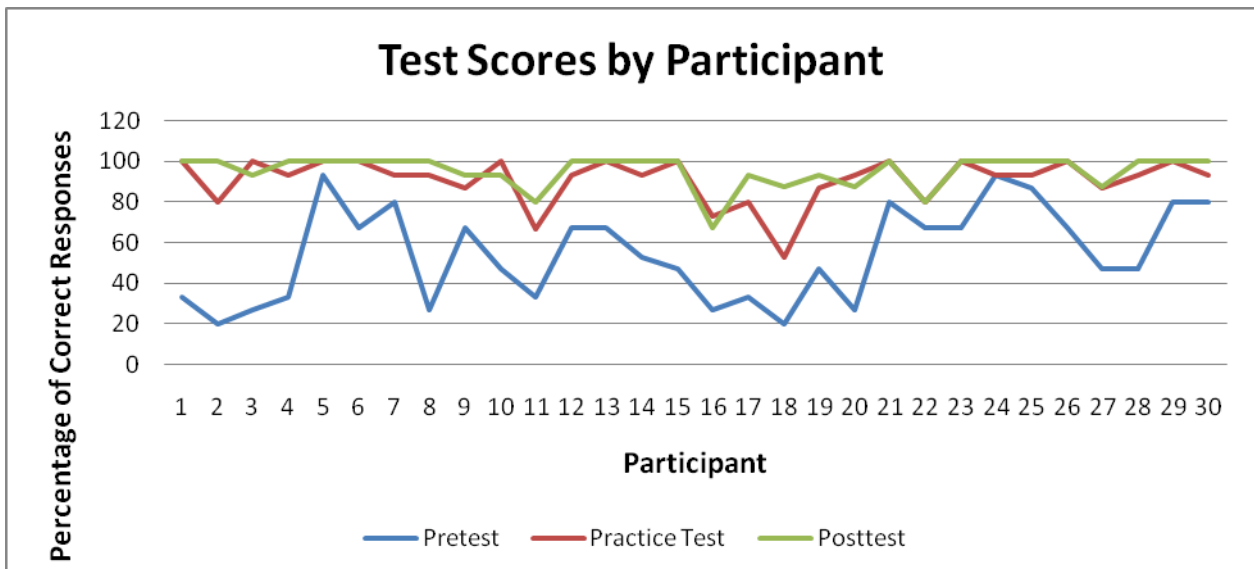
## Formative Evaluation Methodology

The site varies from participant to participant as the module was accessible online for the participants to complete from anywhere with internet access, a computer, web browser, and audio. Approximately one week was given to students to complete the module so that they could choose a time that worked for them. The primary instruments used in this study were tests containing parallel questions (pretests, practice tests, posttests), Likert-scale and open-ended attitudinal survey, and demographic survey.

A total of 30 college undergraduate and graduate students who have some to no experience in APA referencing were tested. They consisted of 14 females and 16 males. Their ages ranged from 19 to 52 years and come from different fields of study, but most were College of Education students. Some were undergraduates but most were master's students and there was one doctoral and one post-baccalaureate student. They all reported they use a computer at least once a day and therefore, had the basic computer skills required to complete the online module. The participants' experience using APA varied from never to at least three times a semester, but were all assumed to have entry level skills such as being able to identify APA reference components (which is the is author, year, etc).

## Results

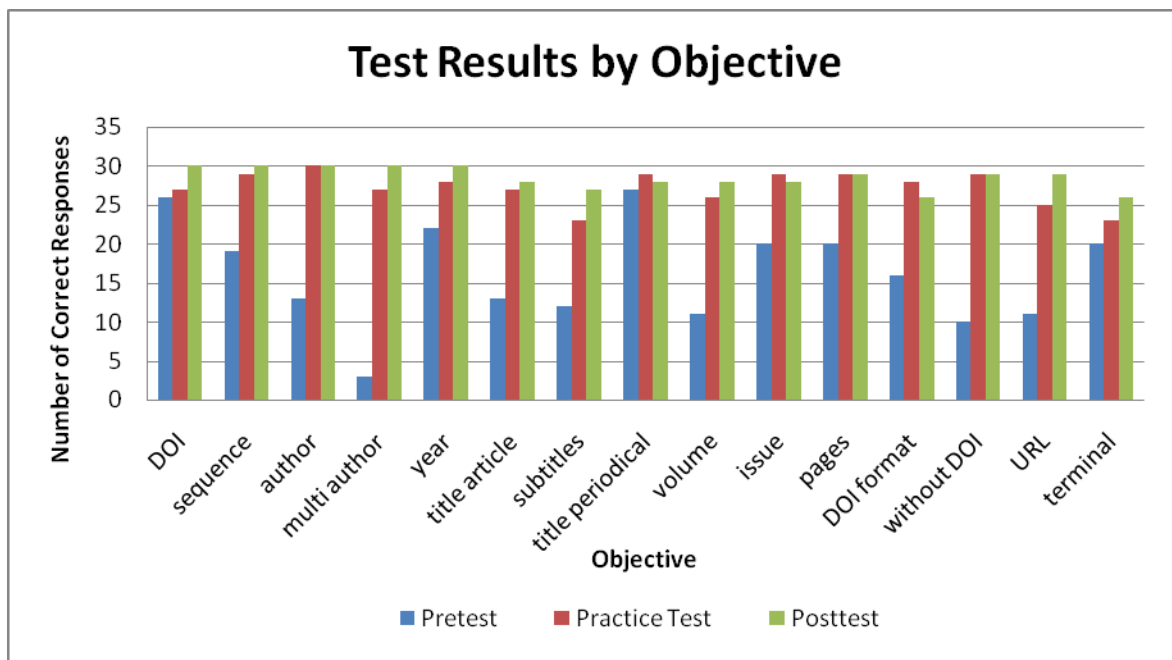
Due to the completely online, asynchronous nature of the project, out of the 42 people who started the module, 30 successfully completed it. One participant stated that she abandoned the module after the second video failed to play halfway through. Two participants who did not complete the practice test stated that they were rushing.



**Figure 1.** Test scores by participant.

Overall, the researcher found the instruction effective based on the pre- and posttest result differences. As shown in figure 1, all participants were able to score considerably higher on the posttest than the pretest. All participants except one received a passing score of 70% or above on the posttest. Participant 17 scored 67% on the posttest, but displayed the ability to receive a passing score by scoring 73% on the practice test. Nonetheless, this participant had started by scoring 27% on the pretest, showing marked improvement by the practice and posttest. One reason this participant may not have received a passing score is that she was disinterested with the module. She commented in the short answer portion of the attitude survey that she felt the interactive exercises could be improved by adding audio. By looking at the demographic and attitudinal data, the researcher found that this participant is a part-time student, while many others were seniors, post-baccalaureate, master's, or doctoral students. Also, English is this participant's second language, leading the researcher to believe that language may be a factor.

Of the 30 participants who completed the module, 19 scored 100% on the posttest and four scored 93%. All participants scored significantly higher on the posttest than the pretest, suggesting the gap was closed due to effective instruction.



**Figure 2.** Test results by objective.

Across all objectives, more participants responded correctly on the posttest than the pretest. The most improvement was shown in the citing multiple authors (Figure 2). Only three participants met this objective in the pretest as opposed to all 30 in the posttest. A plausible explanation may be that format for citing multiple authors (more than seven authors) was answered incorrectly in the pretest because the format has changed from the fifth edition APA manual. All participants were able to meet the multiple authors objective on the posttest, suggesting that instruction for this objective

was very effective. In the posttest, all 30 out of 30 participants met the first five objectives, and 26 of 30 met the terminal objective.

Although there was improvement in all objectives from pretest to posttest, in regards to practice test and posttest comparison, there are three objectives where slightly more participants responded correctly in the practice test than posttest. These objectives are title of periodical, issue, and DOI format. Possible explanations are that the participants became impatient or fatigued, (attitude survey comments showed some participants thought taking three tests were too many), experienced a loss of retention by the end of the hour-long module, or that the posttest items could have been slightly more difficult than the practice test items.

Attitude	Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
Module was accessible and convenient.				4%	96%
The instructional videos were clear.				19%	81%
The amount of information covered was manageable.				8%	92%
Animation, graphics, text, and audio was NOT overwhelming.	4%			15%	81%
Video controls were helpful in learning at my own pace.			8%		92%
Audio narration helped me learn the content.				4%	96%
The videos' animation kept my attention.			4%	19%	77%
The interactive exercises helped me learn the content.	4%			27%	69%
The interactive exercises kept me engaged.				15%	85%
The practice test helped me understand the concepts.				19%	81%
The feedback helped me understand the concepts.			12%	12%	73%
The tests were the same level of difficulty.			8%	8%	85%
The webpages were easy to navigate.				15%	85%
The webpages were functional.	4%		4%	8%	85%
Navigating the website at my own pace was helpful.		4%		19%	77%
I was clearly informed of the objectives of the instruction.				15%	88%
I learned new things.			4%	23%	73%
I did NOT learn much. I had already learned this.	50%	31%	15%	4%	
I feel the information I learned will be useful to me.			12%	19%	69%

**Figure 3.** Attitude survey Likert-scale ratings.

A five-point Likert scale survey was used to collect data about the participants' attitudes toward the module. Of the 30 participants who completed the module, 26 submitted attitude surveys. Overall, the participants felt positively toward the module, especially in regard to accessibility, amount of information, audio narration, interactive exercises, and

clear objectives. Although the researcher hypothesized that the practice test may have been easier than the posttest, hence better scores on the practice test, the attitude survey shows 85% of the participants strongly agreed and 8% agreed that the tests were at the same level of difficulty.

An area to consider for improvement is the interactive exercises. According to attitude survey data, 69% of participants strongly agreed the exercises were helpful and 27% agreed. Ideally, the researcher would like more participants to strongly agree rather than agree. This could be done by adding audio to the interactive exercises. A participant mentioned in the open-ended response section that she would like the interactive exercises to have audio.

Another area that received lower ratings than the other parts of the survey is the last statement, "I feel the information I learned will be useful to me." Sixty-nine percent of participants strongly agreed and 19% agreed, showing the majority of participants felt the information was useful. However, the researcher hypothesizes that a possible reason more students did not strongly agree rather than agree is because some individuals from the sample population do not use APA referencing. According to the demographic survey, nine of the 26 respondents stated that they never use APA referencing. College students were chosen as the target audience for this project because the researcher theorized they would be motivated to learn APA style referencing due to demands of their academic work and the increasing use of electronic resources. However, depending on students' academic standing and major, this was not always the case. The participants who did not strongly agree to the last statement are mostly undergraduate students (as opposed to graduate students) and had majors that may not require use of APA referencing such as fine arts, liberal arts, business, biology, and engineering.

### **Limitations**

This project was limited to the module development and testing of only APA referencing for electronic periodicals. The module consisted of instruction for identifying the sequence and formatting. Referencing for other types of resources was not covered to avoid information overload. Formatting for writing reports in APA style were also excluded from the module.

The technology available to the researcher may have limited the collection of data. COE survey tool was used to present the tests and Google forms was used to collect demographic and attitudinal data. In the short answer section of the survey, some students responded that the "Submit" button on Google forms was too small and they accidentally clicked "Next" and went to the next page instead of submitting their form. Some students redid the survey, but the researcher presumes that some did not, hence the missing surveys. Also, the COE survey tool provided a link after each test that redirected students back to the module webpage, but again, some students commented that this link was too small and had trouble finding their way back to the module. This may be one reason why not all participants completed all tests. In the future, the researcher hopes to

find alternative tools to avoid these problems or have the participants meet face to face so that the researcher can oversee the testing process. However, this would make the module less accessible since the participants would be limited to the researcher's schedule.

### **Implications of Research**

The increase in all 30 of 30 participants' scores from pretest to posttest shows that the module was effective in teaching APA referencing. However, some areas were identified to improve functionality and learning. Attitudinal data shows some students wanted to change the look of the surveys and tests in order to improve functionality and learning. However, the researcher did not have control over the look of the surveys as the COE survey tool did not allow the look of the test to be changed. COE survey tool also did not give feedback individually after each question, but only after the participant had submitted the entire test. In the future, the researcher hopes to find a testing tool that will give feedback after each question. Also, some students chose more than one answer for each question, which may have lowered their scores. In the future, the researcher will use COE survey tool's option to allow only one answer per question.

Based on open-ended responses in the attitude survey, the researcher would like to add audio and more exercises to the interactive tutorial to increase engagement and increase the amount of students who reached the terminal objective. More specifically, since the tutorial only featured a reference with a single author and article title without a subtitle, the researcher would like to include examples for multiple authors and article titles with subtitles in the interactive tutorial.

Although in this project has found instruction on APA referencing via hypermedia and the theories stated above to be effective, more research must be done to determine if this module's success may be repeated in other studies. A larger and perhaps more diverse sample population must be tested.

### **Conclusion**

This web-based instructional module on APA style referencing gave students easy access to learning a skill needed for academic success. This module is a small contribution to the trend automated APA style writing. It also took into account multimedia learning theories and known problems such as cognitive overload, working memory capacity, dual task paradigm, and individual differences. This study has shown that hypermedia was successful in teaching skills on APA referencing. All 30 of 30 participants' scores improved significantly from the pretest to posttest. Furthermore, 26 of 30 participants met the terminal objective. The researcher hopes these findings will be useful to the academic community in selecting instructional design strategies, instructional design models, and types of media when creating instruction so that it will be more effective for learners.



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