Chapter 6

SUMMARY AND CONCLUSIONS

Limitations of the Study

The major obstacle that was encountered in this research study was the difficulty in persuading invited students to actually participate in the study activities. Any number of theories might be advanced as to the lack of interest in participating. The amount of time required, a sense that the incentive was not worth the time, confusion or suspicion as to the nature of the study, or simply the levels of prior commitments that participants had during the full swing of the school year. Any or all of these may have contributed to the lack of participation. The fact is that such a small proportion of the sixty randomly selected sample participated also introduces a level of skepticism as to the representative nature of the participating sample.

Early on in the design process, the suspicion that it would be difficult to find adequate numbers of willing participants led the researcher to develop a plan that attempted to minimize the length of time necessary to participate. This led to an environment where the individual timed sequences in the treatment cycles were quite fast-paced. This rapid-fire pace (12 seconds for each instance of a review/retrieval of a word) combined with the fact that the word-vocabulary pairings were without a relevant, meaningful context may have altered the respective effectiveness of the two main treatments being observed. The Roediger and Karpicke study on which this research was based had participants repeatedly reading an entire piece of prose and likely provided more semantic structure and opportunity for memory through more meaningful chunking.
In the course of planning this study, this same concern for the length of time needed to participate also led to a reduction of the number of target words. Initially the number of target words was forty-five. This number was obviously reduced to the twenty-one words with which the study was actually conducted. The small number of words within each treatment condition provided less opportunity for variation within the means. Having fifteen words assigned to each condition might have allowed the resulting differences in the treatments to be more apparent. On the other hand, this might have also produced standard deviations that were even more exaggerated.

Recommendations

While there was no identifiable difference revealed in this context, both the visualization of the word-definition pairings and the visualization mixed with retrieval attempts produced and measured lasting word/definition pairing acquisition (at least 7 days) in a timed environment. Each of these treatments was statistically different than the results of the control condition.

The assessment and treatment system to which the participants were exposed was web-based and could largely be utilized without instructor intervention. A variation of this system might be offered to students to work on attaining and maintaining sophisticated vocabulary knowledge at the time and location of her or his own choosing.

This concept of anywhere/anytime vocabulary learning might also be expanded if the text of the word-definition pairs were converted to audio files to be listened to during other activities such as exercising, driving, or doing household chores. The Vocab Filemaker Pro database, a utility created to manage the information related to the original
5000 SAT review words during the project development process, had the capability to
generate such audio files since the early days of its development. This utility allows the
user to pick a custom set of word-definition pairs, specify the order (word first or
definition first), and specify the timed spacing between the components before having the
system generate a single audio file that could be repeatedly played on a mobile media
player.

There are many ways that students could employ variations of these systems to
develop and maintain vocabulary knowledge if they have the motivation to direct their
attention toward such a goal.

Future Research

In the future this research design and the tools created to conduct it might be
modified to develop better insights into the vocabulary acquisition process. These
modifications might include ways to conduct the same research more effectively and
might also include ways to investigate additional aspects of vocabulary acquisition.

Expansion to larger numbers of participants might be accomplished by being less
centralized about a specific randomly-selected sample of participants. The researcher has
discovered that it is very difficult to conduct such a study in the population of a
secondary school environment. Perhaps a reliance upon the within-subjects design
utilized in this study to generate defensible comparison results would allow for less
stringent attempts to control the make-up of the group of participants. The web-based
nature of the instruments might allow for a much broader net to be cast which could
produce a much larger group of participants.
Expansion to a larger numbers of target words might provide a greater opportunity for greater differentiation of results between the two primary treatments. A maximum range of seven different scores on a particular condition constrains the potential for variation within scores. Expansion to the original idea of forty-five target words with fifteen in each of the conditions might allow for a greater distribution spread and the disclosure of results indicating a significant effect.

Provision a bank of words to retrieve from in the retrieval treatment (as suggested by a committee member in the proposal defense) might be an option that should be examined in future iterations. This was originally not implemented in an attempt to closely simulate aspects of the Roediger and Karpicke study where the retrieval attempts were specifically free recall attempts and were done without any prompts or resources.

Most participants finished the initial assessment in far less than the ten minutes that were provided. This forced them to basically stare at a screen containing the twenty-one definitions and the twenty-one words for the balance of the ten minutes. The last student that agreed to participate (but who agreed too late to be included in the initial official results) was given an “I’m all done and ready to go on” button to eliminate this apparent waste of time. This micro-experiment gave a purely anecdotal hint to the importance of that time that was previously considered wasted. Without the screen time that her predecessors had she seemed to have far more difficulty in recalling words to type into the retrieval treatment input fields. This input process was key to the retrieve condition treatment. It might be considered, therefore, to introduce a specific timed component when participants are allowed to simply review a list of only the target words.
in a relaxed span of time. This could theoretically replace the suspected function serendipitously provided by the students looking at the screen while waiting for the time for the initial assessment to elapse.

The web-based tools that were are created to conduct this research study have the capability to be altered to introduce variations in timing, variations in the order of treatment cycles, and variations in the number of words. The ability to introduce an audio component to various learning activities is also possible and was present in early implementations of the system. These tools offer opportunities to conduct a variety of web-based or mobile media player-based experiments.

The use of larger semantic units rather than discrete, individual words and definitions might be considered. The introduction of contextual clues that are present when words are part of a larger coherent whole might make the acquisition of new words less cognitively demanding.

Finally, the research activities might better have been done in a large group setting with headphones provided to the participants to eliminate the potential distraction of the audible instructions. Scheduling individualized appointments based on student choice and convenience seemed to do little to encourage comprehensive participation by invited participants. Fewer sessions in a larger setting would provide greater efficiency and less ongoing stress upon building facilities.
Conclusions

Too many other studies have verified the importance of retrieval and practice in developing long term memory for the results of this study to cast doubt upon its effectiveness. It is apparent, however, that the method of visual review mixed with retrieval attempts that was used in this research study was not superior to treatments consisting of visual review alone.

While one might be discouraged in not finding the significant results that one might have expected there is consolation in the fact that the results and the procedure used can be confidently defended apart from the small sample size. It is also exciting to consider the possibilities of future studies that might utilize the technology tools developed for this research study.