
Flashcards: Meaning-Making Methods for Students' Success

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In college, there is important knowledge students must learn and keep in mind, which requires excellent memory. With that said, going to college in a different country makes it more difficult for international students to keep up with their studies. It is my hypothesis that having a good memory will help international students to remember and apply theories to practical experiences. For example, students will know how to solve exercises or homework problems when they learn to revise the in-class material carefully. Not only do they need to study and do homework to memorize the material, they have to try different study methods to help them gain and store knowledge effectively. There are multiple study methods to help them improve their ability to store knowledge, such as making schedules to study, composing a study guide for each class, and writing flashcards. Flashcards are an ideal choice for international students who want to use their native-language writing or cultural practices to systemize their knowledge so that they can extract meaning and comprehend the material in more relatable aspects. The focus of this research is to understand how international students use their native-language writing to reorganize material in a condensed way using flashcards and visual aids to ultimately absorb and store a large quantity of knowledge.

Flashcards have been determined to be an effective and easy method for students from all backgrounds and cultures to study because there are no sets of rules for making them. Therefore, students are able to be creative in producing their own flashcards. Depending on a student's culture or study habits, they may choose to incorporate images, maps, examples, different languages, or even different ink colors to make meaning of the material. Flashcards encourage students to summarize and shorten the material from textbooks so that they can more readily absorb the information.

Claudia Leopold, Elke Sumfleth, and Detley Leutner have conducted research on the importance of self-generated summaries and visual aids and how they work together to create meaning. They explain that if students use pictures and incorporate them with their own writing and understanding, they are more likely to remember information and learn faster. Their research also indicates that the students' personal writings can be creative and dynamic as long as it helps them to fully understand the material (Leopold et al. 42).

In a different aspect, Moragh Paxton, a professor at the University of Cape Town, concentrates on the relationship between text and context. According to Paxton, "context is not something we can just add to text; we need to understand the contexts in which sense making practices develop because the way in which language fits into context is what *creates meaning* and what makes it (mis)understandable to others" (Paxton n.p.). Paxton argues that text and context are related and assist each other to produce meaning. This suggests that writers use their language to describe the text's content so that it can successfully fit into context.

Unlike Leopold et al., Leopold and Leutner, and Paxton, Bronwyn Williams, a professor at the University of New Hampshire, emphasizes how to state personal thoughts in writing. He

explains how to explore the text's meaning by selecting primary information and creating a sequence for the information. Williams' study significantly shapes the process of making flashcards as students can truly involve critical thinking and solidify new knowledge for themselves. Williams maintains that "this does not mean simply writing about what happened to you and how you feel about it. It requires that writers... must make connections from their experiences that help them come to new knowledge and understanding." His perspective demonstrates how writing requires people to relate the material to their own experiences, which later helps them to learn and store new knowledge that is not from the text. Brian Moon, an English professor at Edith Cowan University in Perth in Australia, holds a different point of view from the aforementioned researchers. He expresses that "copying taught their students concentration and correctness, developing in them a feel for clear expression and well-formed sentences" (47). His research suggests that copying exact words from the text can teach students how to write in a formal and academic way so that they are able to express the material clearly and form their sentences well. While Moon thinks that copying is good for students, Williams provides a different argument that personal writing goes together with visual aids can create diverse genres in writing and meaning of the texts. Leopold et al., Leopold and Leutner, Williams, and Paxton all emphasize the merits of personal writing and meaning making, but there is a gap in research in how flashcards are specifically used to create meaning in knowledge.

This paper aims to address this need by focusing on the importance of summarizing, embedding creative images, and personalizing knowledge in flashcards. In order to explore these ideas, different research methods such as interviews, personal images, and research studies about flashcards have been included.

In order to examine the effectiveness and value of flashcards, I carried out interviews with international students at the University of Central Florida (UCF) in the United States and multiple universities in Vietnam, such as Lotus University, the University of Economics, and the University of Medicine. The interviews were conducted via email as I wanted to give the interviewees time to carefully think of how they utilize flashcards to create meaning and understand the material in personal ways. One of the students interviewed, Nhu Huynh from Vietnam, explained how she thoughtfully reflected on her use of flashcards to create meaning of her texts when learning foreign languages. When asked if she used flashcards, she responded that she loved using them to learn English, Korean, and Japanese. She usually draws pictures that symbolize her new words in order to keep them fresh and remember them easily. She admitted that she also wrote down the pronunciation of the words to help her learn how to pronounce them properly. Those pronunciations also served as a type of visual aid to help her remember how to say the words correctly as a result of the shapes of the letters.

A separate interview was conducted with Nguyen Vu, who is majoring in Bio-Chemistry in Vietnam, to see how students personalize flashcards and to evaluate the efficiency of personal flashcards. Nguyen reports that he has been taking advantage of flashcards to make meaning of his material for five years. He mostly used flashcards in Biology and Chemistry, as those two classes are particularly important to his major. When asked about the ways he produced meaning for his own flashcards in Biology, he reported that he liked drawing pictures on the cards to represent body parts. He also wrote down the names of those parts under the pictures. By doing this, he could not only learn the names of the body parts, but also remember the part's shape to better his practices in a future lab or experiment. For his chemistry course, he utilized flashcards to learn chemical

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reactions and chemical formulas. If he was able to think of any image that stood for the chemical reaction, he would draw it on the flashcard, use his own word to describe the chemical reaction, and include the formulas for that reaction. The more significant the chemical reaction, the more stars he would put on the flashcard.

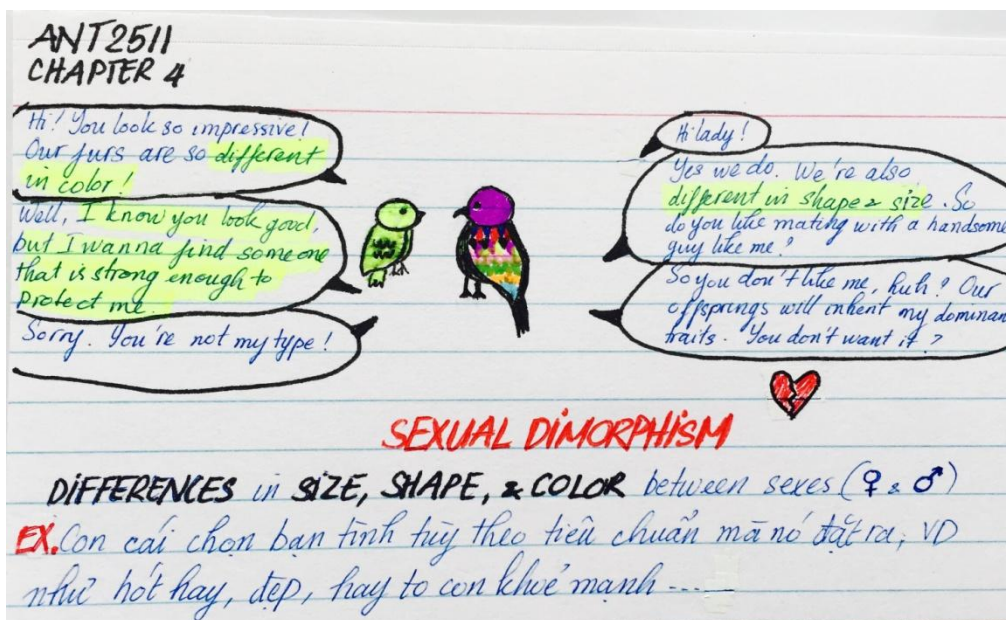


Figure 1: Anthropology flashcard by Duong Nguyen

During the interviews, flashcard samples from each international student were collected to examine how each student personalized their flashcards and created meaning out of the material in a small amount of space. Duong Nguyen, who is an Elementary Education student at Lotus University in Vietnam, composes a flashcard to learn the content in her Anthropology class. Duong successfully pointed out how she composes each flashcard in a personal way to create meaning of the material and make the flashcard understandable for her. She made a lively flashcard by using images, different ink colors, multiple languages, and an example to explain the concept of “sexual dimorphism.” She made up a conversation between a male and female bird so that she was able to interact with the key ideas of the term directly and interpret the definition clearly. The illustration of two birds with different sizes and colors helped her to produce the vocabulary’s meaning and remember it in her own way. When she looked at the picture of two birds, she would automatically recall the details like the birds have different sizes, shapes, and colors on their feathers, which related to the original definition of “sexual dimorphism.” Then, if she read the conversation and saw the highlighted words, she would learn the word’s meaning one more time.

Duong wanted to make sure that she comprehended the content. Therefore, she extended the meaning of “sexual dimorphism” by providing an example in her native language to comprehend the material entirely. For her flashcard, she stated that the female bird always chooses her mate based on her own needs. For example, the male bird should have a sweet voice, a good-looking appearance, or a large body to defend his mate and his offspring. Due to her own example and explanation of “sexual dimorphism,” this flashcard pushed her to relate sexual dimorphism to the idea of mating habits of creatures. She realized that in order to attract the female bird, the male has to compete against others. More than that, Duong also came to understand that the female bird, above all, wants to find a strong mate in order to scare away predators and become a productive hunter and caretaker. Thanks to this example, she was able to relate the bird to different animals

that are also sexually dimorphic such as spiders, lions, peacocks, and frogs. By designing her personal flashcard, she was able to learn and process the information four different times through image, conversation, actual definition, and example. Consequently, Duong could interpret the meaning thoroughly, extend the definition by giving an example, and hardly forget the term “sexual dimorphism.”

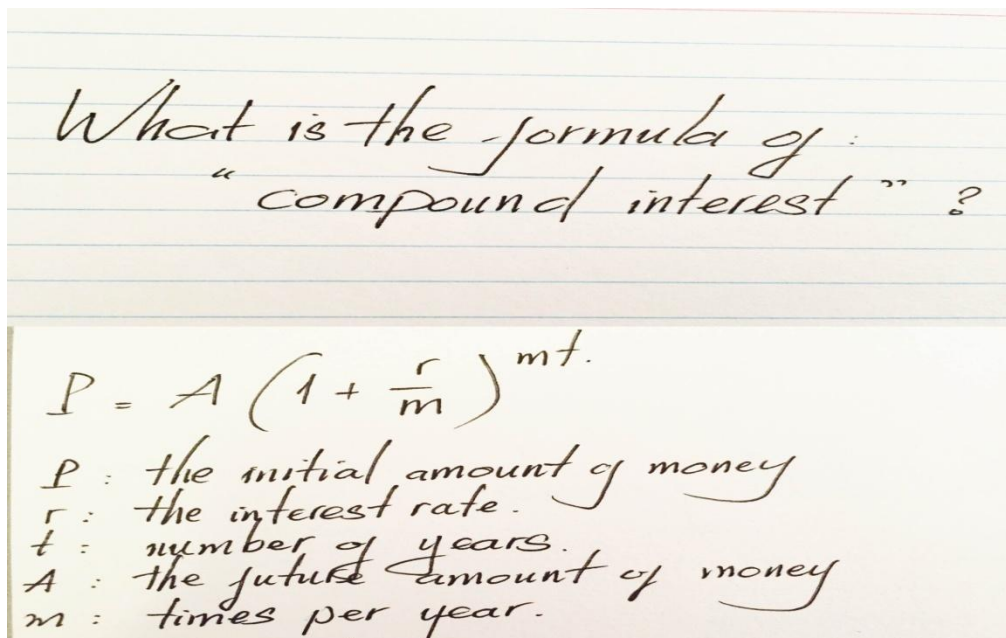


Figure 2: A Mathematics flashcard by Li Lu

The flashcard above continues to illustrate multiple ways of making meaning for international students. Figure 2 is attributed to Li Lu in College Algebra 1105C at UCF. This flashcard helped her make a connection between the formula and its name. She has a simple way of composing flashcards to make meaning. She only used black ink for the entire flashcard and enlarged the title and the formula to distinguish it from other formulas. Li made use of both sides of the flashcard. On the front side, she wrote down a question, which was, “What is the formula of ‘compound interest?’” On the back of the flashcard, she jotted down the formula $P = A\left(1 + \frac{r}{m}\right)^{mt}$ and a representation of units to know how to put the number correctly. In this way, she created a relationship between “compound interest” and its formula. The reason why she wrote the question and the answer on different sides of the paper was because she could immediately see the formula’s name standing out easily whenever she went back to revise them. If the conversation of the birds in Figure 1 was the main point to explain sexual dimorphism, the formula in Figure 2 would be the most important material to help this student solve her mathematics problem. The process of making this connection helped Li to interpret the meaning behind her knowledge as well as to remember the material quicker. Moreover, thanks to her personal composition method, she is able to revise and recall the material on the flashcard easier. When Li Lu sees the words “compound interest,” she will immediately correlate this to the matched formula without any confusion or forgetfulness.

The aforementioned flashcard sample was slightly different from Duong’s flashcard sample, as it did not contain any images. Although the students from both figures had different methods of designing their flashcards, they both were able to produce meaning based on their personal composition methods. They were also able to understand the material in the way that made sense

to them. In Figure 2, Li did a great job in attaching the formula's name with the actual formula and explanations for each unit to learn and solve problems effectively. This proved that Li has incorporated her own codes and images so that they could support each other to help her understand the material.

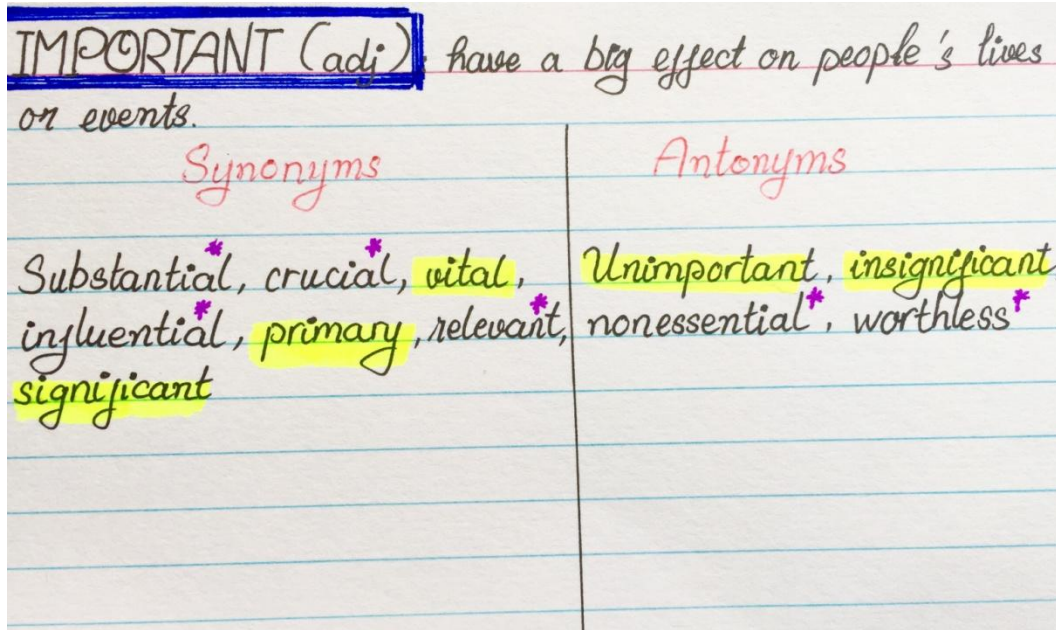


Figure 3: An English for Academic Purposes II (EAP II) flashcard of a Tourism and Hospitality Management student at UCF

Figure 3 is a flashcard sample by Tuan Hoang in his EAP II course at UCF. The purpose of this flashcard was to help this student extend his vocabulary use. Similar to Figures 1 and 2, this student chose to enlarge the key word, which was "important," to distinguish this flashcard from the others. He wrote the definition of "important" to make sure that he understood and did not forget its actual meaning. He also used color codes to classify different types of words. He gave each color its own meaning. For example, he covered the word "important" in a blue square, which meant that it was the key word on the flashcard. Then, he used red color to refer the headings or subheadings, which were "synonyms" and "antonyms." After he learned a new word, he listed the synonym and antonym words of "important" down by using black color. In Figure 3, there were some slight differences with the rules of color codes. For instance, when the words were highlighted, this showed that he had often used those words in his writing. Words with purple stars meant that the student did not remember them well and did not frequently implement those words in his papers. He put the purple stars next to the words to remind himself that he should use those synonyms or antonyms in his papers more often instead of the word "important."

His process of jotting down synonyms and antonyms was similar to the process of personalizing material from the texts. In particular, he read, gathered knowledge day by day, and understood the material in his own ways. After he learned and comprehended the knowledge, he processed this information by creating a sequence of synonyms and antonyms of "important" on flashcard to widen his understanding as well as his uses of language. By writing synonyms and antonyms on flashcards, he could better remember the material. Due to his understanding and interpretation of the material, he was able to diversify his vocabulary, truly understand the

meaning of “important,” and create the connection between “important” and its synonyms as well as its antonyms.

The interviews with international students in different majors and the three flashcard samples have demonstrated the significance of personalization methods and visual aids on flashcards to help international students learn and remember the material effectively. These students enjoyed drawing symbolic pictures and utilized different color codes to represent key material on their flashcards. The results of combining visual aids and text on flashcards were not negated. These students were able to effectively remember the material and apply their knowledge to assignments.

Three flashcard samples of international students in different majors tie back to what Leutner, Leopold, Sumfleth, and Paxton have researched on how to sum up and personalize material to create meaning. For Li Lu’s flashcard, she understood that summarizing, sorting, and organizing important content to put on her flashcard could help her remember and understand the material. She did a great job at doing so by attaching the formula’s name with the actual formula and explanations for each unit to learn and solve math problems effectively. This proves that Li has incorporated her own codes and images to help her understand and cross-relate material. Thus, her flashcard can directly support Leopold, Leutner, Sumfleth, and Paxton’s research studies about the relevance of summaries and personalization.

Figure 3 mostly relates to Paxton’s perspective of how people use their own codes and languages to create meaning from text. Writers need to have a wide knowledge of the subject. In this case, Hoang needs to understand the meaning of “important” thoroughly. Then, the writers will be able to use their own codes and personal thoughts to synthesize key points. In Figure 3, after Hoang learned the definition of “important,” he was able to, recognize different vocabulary words that had similar and contrary meanings to “important” and jot them down on his flashcard to study. Moreover, he has utilized different color codes to help him pay close attention to those words. Specifically, the highlight marks referred to words that he often used, and words with a purple star meant that he did not use the words frequently. His procedure of composing flashcards helped him widen his use of diverse vocabulary and overall made his writing more diverse.

Similarly, a close relationship can be seen between Duong’s flashcard and Williams’s research study about foraging a relationship between materials. Due to the small space on an everyday flashcard, it was challenging for Duong to think of a symbolic figure to represent the material. She would not be able to completely understand the meaning of sexual dimorphism if she did not relate the material to the picture and the conversation between a male and a female bird. Therefore, she had to examine what picture to place on the flashcard, and then combine it with the definition later to fully understand and widen her knowledge on “sexual dimorphism.” Duong’s flashcard significantly related to Williams’s research in terms of selecting and creating a sequence for the content and stating personal thoughts by visualizing and giving an illustrated example. By doing this, Duong was able to draw connection between materials, discover new information, and effectively remember the bond between that material.

In conclusion, this research has validated the idea that flashcards are a useful study tool for students in different levels of education from around the world. Flashcard construction plays a significant role in a student’s success in college. Due to their size constraints, flashcards motivate students to summarize the main points from textbooks, use their own ways to design and create meaning out of the material, and organize the key points in ways that are understandable to them. Students can take advantage of flashcards to learn, enhance their memory, and actively recall the material. However, more research projects and case studies should be done to examine how international students from different cultures use flashcards in a new learning environment to produce meanings that are understandable for them.

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Linh Tran is an international student who was born in Vietnam. She is a sophomore at the University of Central Florida and is majoring in Health Sciences. She has been recognized on the President's Honor Roll and Dean's List twice. She is a member in different honor society organizations. Furthermore, her research projects about flashcards have been selected for presentation at the Knights Write Showcase 2017 and 2018. She hopes to attend graduate school after completing her bachelor's degree.