

Spaced repetition strategy using augmented flashcards to enhance concepts for Deaf

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The Issue

Deaf learners must be able to grasp the species of abstract concepts necessary for academic success. These concepts are acquired and developed through interaction with suitable learning media that is used in assisting special-need students. An important multimedia material to contribute to attaining these concepts in students is augmented flashcards. Deaf students, who are more at risk for difficulties in understanding the high degree of abstraction required for some knowledge, can be an accessibility barrier for them, where retention is a common problem for them. So an augmented flashcard is a valuable multimedia that can be employed in teaching strategies to foster their concepts.

What we know and what we do not know

Deaf students depend more on visual information, so researchers have proposed using augmented illustrated flashcards to support the education of students with hearing impairments to benefit the students and their parents who may struggle to support their children's learning. Flashcards are especially helpful in providing an interactive and engaging way to learn, and deaf learners can use them in different places because of their small size and portability. Augmented flashcard technology combines the virtual world with the real world by superimposing virtual objects on a real environment using three-dimensional images, to increase motivation, and help in scaffolding the knowledge of deaf students and retention of vocabulary.

Conceptual augmented flashcards have proven to be an effective self-assessment and revision tool that would aid students' remembering concepts, through integration into deaf education, from being used as a study technique to being provided as an aid in teaching strategies. One of the teaching strategies to improve a learner's vocabulary is the spaced learning strategy an old strategy, that has been proven powerful for memorization. This strategy works well for displaying vocabulary at multi-interval. Spaced learning strategy prioritizes active recall that learners review items in a given

schedule, to improve long-term concept retention. There is a variety of spacing formats, ranging from dispersion of concepts on a single day, to intervals lasting several months. According to cognitive load theory, this helps reduce the amount of new concepts presented to the deaf student. Also, the deaf student is actively involved with augmented flashcards through a spaced learning strategy.

Spaced repetition strategy based on augmented flashcards.

- Allow the student to hold the augmented flashcards and turn the front/back card.
- Introduce and discuss the first concept, using the augmented materials attached to the card (3D model or video, in sign language to explain the concept).
- Exposure to the first interval (an external activity not related to the content, such as playing).
- Repeat the first concept.
- Exposure to the second interval (An activity that is not related to the learning content).
- Repeat the first concept.
- Ask questions about the concept on another side of the card.
- Praise and reinforce.
- Exposure to the third interval (playing).

Spaced learning should include learning sessions that are spaced over time and include repeated information. The most important aspect is to introduce content, that contains a small amount of information, held up for deaf students to see, as an aid to learning in three separate study periods, with a ten-minute study break doing an external activity not related to the content, where psychological research findings on the mechanisms of memory formation suggest that spaced learning works using shorter intervals, better knowledge will be achieved if the content is presented in a learning process which involves repetition for a second or third time after diverse intervals.

For engaging actively in recall and retention, retrieval-based augmented flashcards strengthen memory and information retention by using the spacing effect, which states that retention improves with repeated exposure to information and concepts over time, and active recall, which stresses the importance of actively stimulating memory. For deaf learners, it is important to turn to adults for a spaced learning strategy applying (interval and repeat).

Implications

The flashcard, which combines the real and virtual world is an effective activity to reinforce new concepts among deaf students by increasing motivation and thus improving students' knowledge and learning outcomes. This can be done by scanning the code on the augmented flashcards (three-dimensional images, Video in sign language). Weave augmented flashcards in the Spaced repetition strategy results in better retention of concepts. Most of all, design the card and use it well in teaching.

References

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