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Mimio Webinar Series | The Research Behind Why Technology in the Classroom Really Works
December 10, 2015
Presenter: Christopher Leonardo & Dan Winkler
Recording Link:
https://mimio.adobeconnect.com/p56utu6dypv/

Comments, Questions and Answers:

Q: Does repetition play a bigger role than association in retaining information? I teach pre-school so making activities relevant is what I do. We use the Creative Curriculum which is research based, as well as ECERS and CLASS and NAEYC standards.
A: I don't think they are competing strategies, but instead work together to build knowledge. Both practice and association works on solidifying the memory and gaining a better understanding. I like to think about association as allowing the knowledge to stick (since all knowledge is linked and related to existing knowledge) and repetition makes the knowledge stick and last longer.

Q: You gave some great ideas on connecting new info to established knowledge.
A: There was a nice analogy that I heard at some point, but can't remember which podcast or article it was in. The teacher said that they tell their students to recall the information but to not look at their notes. Instead she instructs them to close their eyes and imagine that the memory is a forest and to retrieve the memory by following a path through other concepts to the new idea. It was an interesting way to think about the memory but definitely took advantage of our visual memory to help them retain the information.

Q: I've encouraged students to use music during exams, with headphones, if that works for them.
A: If you let them listen to music during exams you should explain that it will help to listen to music while studying. It's been shown that keeping environments similar helps performance since the memories are also related to the setting in which you learned them. Another strategy is to study in multiple environments to even further enhance learning.

Q: Isn't it also true though that repetition also builds strong synapses (and dendrites)? So if we can engage students in repetition of key, basic, skills will mean those are accessible later to build on?
A: Yes. Repetition and practice are the key to building stronger synapses.

Q: Do the students show on some of the presentation slides have tablets that are linked to the display board?
A: They are using our MimioMobile™ app on iPads and MimioPads. They are collaborating on activities using our MimioMobile and MimioStudio™ software.

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Q: I like to use virtual field trips to engage students. If a field trip is not an option, you can also engage students using Skype classroom. Here some helpful resources for virtual fieldtrips:
> http://www.educationworld.com/a_tech/tech/tech071.shtml

> http://www.educatorstechnology.com/2014/01/20-wonderful-online-museums-and-sites.html?m=1

A: Great ideas! I added them to my Education Technology Flipboard: http://flip.it/w80BX

Q: I struggle to understand how learners can't apply knowledge retained in one subject and apply it to another subject, like math, science and technology. They overlap but I end up teaching everything over and over and over. Suggestions?

A: This sounds like it could be a problem with how strong the knowledge is. In order for the brain to use the previous knowledge it has to be well formed enough to be consolidated into one chunk in the brain. There is a great course that describes this in great detail here: https://www.coursera.org/learn/learning-how-to-learn

Memory

Neuron, Synapses and Dendrites - Information about how memory works.

Images of a neural net - A great image of neurons, dendrites and synapses.

20 facts about working memory - Interesting facts and research on working memory.

Article on Memory Capacity - Interesting data on how much data can fit in the brain.

Limitations of Working Memory - More research on working memory.

Deep Engagement

Negative Emotion Enhances Memory Accuracy - Effects of emotion on memory.

Emotion and Memory Research: A Grumpy Overview - Additional research on emotions and memory.

Brain's Link Between Sounds, Smells and Memory Revealed - How the senses affect memory retention.

Teacher using whole brain learning - Teacher using sounds and activity to boost memory retention (Whole brain learning).

Student Engagement and Student Learning: Testing the Linkages - Highly positive correlation between engagement and educational outcomes.

Student Engagement and Student Outcomes - A study on student engagement and the link to outcomes.

Student Engagement More Complex, Changeable Than Thought - Another study on student results being linked to engagement.

Strategies for Students lack interest or motivation - Strategies for increasing engagement

How We Can Connect School Life to Real Life - Article on how real life relevance relates to student engagement.

Assessment for Learning

Improving Students' Learning With Effective Learning Techniques - Study on effectiveness of different recall methods.

Assessment, Accountability, and Improvement - Article on assessment for learning vs. the negative effects of assessment for evaluation and accountability.

Retrieval-Based Learning: Active Retrieval Promotes Meaningful Learning - A study on on the efficacy of retrieval based learning.

The Brain's Default Network Anatomy, Function, and Relevance to Disease - The research behind passive/active or diffuse/focus methods of learning.

The benefit of interleaved mathematics practice is not limited to superficially similar kinds of problems - Study on how interleaved practice outperforms practicing the same material and/or problem type.

Collaboration

Powerful Learning: Studies Show Deep Understanding Derives from Collaborative Methods - Nice article based on research on how collaboration, relevance, and project based learning are all valuable classroom tools.

Expecting to teach enhances learning and organization of knowledge in free recall of text passages - Research on how just telling students they will have to teach the material has a positive impact on learning.

How Cooperative Learning Works for Special Education and Remedial Students - Study in which 21 general education classroom teachers were interviewed about their use of cooperative learning and the teacher's perceptions of how cooperative learning benefits special education and remedial students.

Student Team Learning: A Practical Guide to Cooperative Learning - Guide that describes five types of student team cooperative learning activities and their positive outcomes in the areas of student achievement, integration, mainstreaming, and self-esteem.

Collaborative Learning Enhances Critical Thinking - Study that examines the effectiveness of individual learning versus collaborative learning in enhancing drive-and-practice and critical-thinking skills.

Creating a Positive Climate: Cooperative Learning - Article that specifically highlights collaborative learning as a positive alternative to better serve students with disabilities.

Peer Pedagogy: Student Collaboration and Reflection in a Learning Through Design Project - Project-based learning research published in the Teachers College Record.

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Cooperative Learning: Students Working in Small Groups - Stanford University newsletter article highlighting the benefits of collaborative learning in small groups.

Expecting to teach enhances learning and organization of knowledge in free recall of text passages - Research about the expectation to teach adding to better recall and more correct answers.

Additional Resources

Learn how to Learn - A detailed course for your students on effectively learning strategies.

Make It Stick - The Science of Successful Learning

Mindset: The New Psychology of Success - Book on mindsets that talks in depth about core fundamentals of engagement, including relevance and having an open mind.