

The SEM Infusion Based Approach to Curriculum Enrichment: Jazzing Up the Common Core

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Q: How do bakers get the jelly in the jelly doughnut?

A: If you don't know the answer to this question take a look at the picture on page 10.

The Schoolwide Enrichment Model (SEM) uses an *infusion based* approach to dealing with prescribed curricular content. We do not criticize nor recommend “throwing out” basic curriculum, current practices, programs, or projects if they are currently producing positive results in *both* achievement and joyful learning. Rather, the SEM strikes a balance between traditional approaches to learning and approaches that promote thinking skills, hands-on learning, and creative productivity on the parts of all students. Our goals are to minimize boredom and “school turn-offs” and to improve achievement and creative productivity by infusing what we call The Three Es (Enjoyment, Engagement, and Enthusiasm for Learning) into the culture and atmosphere of a school. We can do this by placing an easy-to-use teaching strategy into the tool bags of teachers.

Selection, Injection, and Extension

An Infusion Based Approach simply means that teachers will:

- examine opportunities to review and ***select*** highly engaging enrichment-based activities related to particular topics,
- ***inject*** them into the curriculum to make the topics more interesting, and
- provide support and encouragement for individuals and small groups who would like to ***extend*** their pursuit of the enrichment activities.

The following examples demonstrate how an Infusion Based Enrichment approach works:

- An elementary teacher was required to have her students memorize all the states and capitals of U. S. cities. To make the assignment more interesting she gave them an opportunity to select a project that had something to do with this topic and that was related to a personal interest. One group of students interested in music decided to develop a rap song for their state's official anthem. Another group interested in history decided to develop historic site maps, posters, and travel brochures for a state they had visited or would like to visit some day. A third group used state shaped cookie cutters to make an edible map of the U. S. using chocolate bits to designate the locations of each state's capital. This group of students was so enthusiastic that they extended their work by visiting other classrooms, sharing their cookies with other classes, and providing brief historical facts about some of the states.
- A middle grade math teacher had her students develop fictional fantasy baseball cards and analyze the players' statistics to draft and trade players while building their own teams. They drew caricatures of their players and a "Player Wheel" with geometric representations of players' strengths and weaknesses was created and used to play against other students' teams. A regular season schedule was set for the class, ending with a World Series game to decide the classroom champion.
- A high school AP Physics teacher assigned a year-long project that encouraged students to use all of the concepts they covered in his course for addressing a practical problem. The project asked students to apply everything they had learned in Physics. One group decided to study the

topography of their area by launching a weather balloon carrying a video camera, a GPS tracking device, and various weather data gathering instruments high above the Earth's surface. They recorded the journey, prepared topographical maps, and analyzed data about temperature, air pressure, and humidity. At the end of each unit of study the teacher asked students how the principles and concepts they studied in the unit applied to their project, making learning more relevant and meaningful.

- A middle school social studies teacher covering Ancient Egypt used our Renzulli Learning System database to find a site that enabled students to conduct a virtual dissection and preservation of their own mummies. Tools for removing organs, labeling them, placing them in jars and glueing, wrapping and preserving their mummies enabled them to have hands-on experiences that made this topic more meaningful. Material in hypertext familiarized the students with Egyptian language and culture. The excitement of this activity created interest that had far reaching affects on interest and motivation that extended beyond simply covering the material in a textbook.

The Role of Technology in finding Resources for Infusion

This engagement and infusion approach works because teachers have the tools to implant highly engaging material into the standards based curriculum and to use technology to locate what we call Just-In-Time Information (J-I-T) that is relevant to their projects – exactly what adult researchers do as they go about the investigative and creative processes. The advent and easy access to the larger world of knowledge has provided opportunities to make formal learning a different process than it was a decade or two ago. Today's young people are digital learners and emerging masters of interactive media technology using cell phones and hand-held devices regularly to access J-I-T information (e.g., movie, bus, and TV

schedules, sports scores, restaurants, etc.). Traditional ways of learning, even under the best of circumstances, cannot compete with students who find texting under their desks more engaging than listening to their teachers and professors or memorizing factual material for a forthcoming test.

Another development in technology that will aid infusion is the unlimited amount of information now available through the Internet. Thousands of free course-related materials are easily accessible through organizations such as the Kahn Academy, which has produced more than 4,000 videos on topics across all grade levels and several curricular areas. The Massive Open Online Courses sponsored by some of the best-known universities in the country, including MIT's OpenCourseWare program and Coursera, have produced thousands of courses that can be widely accessed without cost.

Changing the learning process has become a reality due to the unlimited access to the knowledge sources mentioned above. Teachers, however, can also become creative contributors to the resource stockpile and the producers of their own televised lectures, course related material, and media events. Free or inexpensive software now enables teachers to prepare and upload their own lectures and assignments for student use anytime and anywhere through the application of easy-to-use screen casting software (e.g., Camtasia Studio 8, Screenflow Software).

A program called Juno (<http://gofrontrow.com/en/products/frontrow-juno>) enables easy recording of high-quality audio/video clips without adding any extra work to a teacher's day. The program automatically adds titles and prepares files for uploading that can then be accessed by computers, tablets, smart phones, or interactive white boards. In addition, as mentioned above, content recorded by others is readily available in all subject areas. These resources enable teachers to easily turn their lectures and related lesson planning tools into audio and video

podcasts and printed course and video materials that can then be uploaded for student access. We can capitalize on students' fascination and skills with technology and the availability of vast amounts of on-line material by giving teachers the license and ability to infuse creativity and thinking skills activities into standards driven curriculum.

While it is not practical to use infusion for every topic or course, this approach makes learning more engaging and creates an enthusiasm for learning that seldom results from covering curricular material in traditional ways. The guidelines for infusion are easy to follow:

- Select an activity that does not always have a single, predetermined correct answer.
- Find things that students do rather than sit and listen to.
- Give students choices that they will enjoy pursuing.
- Select activities that have various levels of challenge to which interested students can escalate.

Finding activities for infusion is now easier than ever. Internet-based search engines such as the Renzulli Learning System (www.renzullilearning.com) allow teachers to enter topics, subtopics, and sub-subtopics by subject area, grade level, and difficulty level. Thousands of high engagement activities that enable teachers to locate and infuse an almost endless array of exciting enrichment activities can be found with this new technology.

Preparing for the Infusion Process

In the example mentioned above related to learning the names of U. S. states and capitals teachers used infusion activities in order to engage students' enthusiasm for learning. A traditional brainstorming technique¹ and the Creative

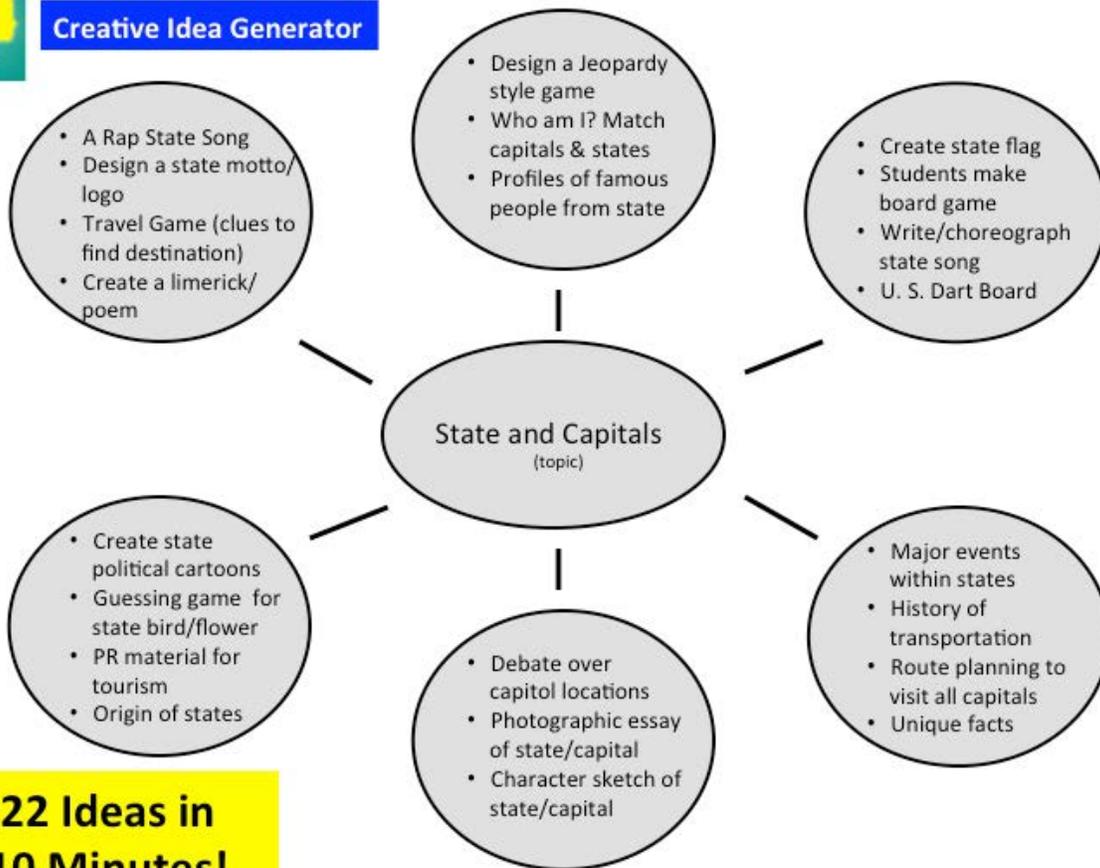
¹ Brainstorming is a group or individual creativity technique by which efforts are made to spontaneously list many ideas for addressing a particular problem. A brief list of Brainstorming tips is presented in Appendix A.

Idea Generator presented in Figure 1 were infused into the lesson in order to engage students and to come up with as many ideas as possible for making the teaching of this topic more interesting. Guidelines for brainstorming were briefly discussed (see Appendix A) and teachers were asked to apply as many of the following criteria as possible to the brainstorming process.

1. The activity has a relationship to one or more regular curriculum topics.
2. There is not a single, predetermined correct answer or solution to the problem raised in the activity.
3. The activity consists of something students do rather than sit and listen to.
4. The activity is fun for most students.
5. The activity should lead to some form of product development on the parts of students.
6. The activity has various levels of challenge to which interested students can escalate if they would like to creatively extend the interest through follow-up activity.



Creative Idea Generator



Students were then given an opportunity to select an activity that they would like to pursue based on their individual interests and learning styles. Most students chose to work in groups, however a few students preferred to work on their own. Infusion activities cannot only make a traditional, memory oriented topic more interesting, they can also present opportunities for developing creative, analytic, and investigative learning skills. Students learn cooperative, collaborative, and other executive function skills, strategies for acquiring J-I-T information, and most importantly, that learning is, in and of itself, an enjoyable process.

Someone once asked me what is the “value” of infusing these activities into the curriculum? I answered, “High engagement and involvement activities are

remembered long after the facts, or dates, or formulas you learned in fourth period math or social studies are forgotten.

Appendix A

Guidelines For Brainstorming

1. Introduce the question to be brainstormed and review the rules of brainstorming:
 - All ideas are welcome
 - No comments criticism or evaluation during the brainstorm
 - The more ideas the better
 - Don't worry about duplicate ideas at this point
 - Piggybacking on each other's ideas is encouraged
2. Explain what will be done with the brainstormed ideas Write the question to be brainstormed at the top of the first page of flipchart paper.
3. If you wish, offer a one minute "quiet period" before the brainstorm for people to think about the question and jot down a few idea.
4. Begin the brainstorming.
 - Guide the brainstorm by recording ideas on a flipchart or whiteboard as they come. You may wish to designate a recorder (see **Tips for Recording**). Stop any comments that evaluate ideas. Invite new ideas, and encourage the group to share their ideas freely. Help generate energy and free-thinking through encouragement.
 - As the responses slow down, offer last chances for additional ideas, then stop the brainstorm. Ask the recorder for his or her ideas. Thank people for participating.
5. Ask for clarification of any ideas that are not clear to you or others.
6. Discuss ways that the ideas can be presented to students in appealing ways (e.g., dramatizations, role playing, artistic or pictorial representations, debates, games, friendly competitions, story telling, digital graphics, 3-D printing, film making, Facebook or Twitter exchanges, community service projects, entrepreneurial endeavors, etc.).

How Infusion Works

