Annotated Bibliography

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Teachers can work to assist creating application from classroom learning. This article discusses some methods for creating mathematical common sense and develops skills in multiple contexts, not simply abstract concept development. Evidence is provided that students understand the mathematical concepts, but struggle with real world context, often presented in word problems. For example, students could articulate a point on a graph plane, but struggled to interpret the meaning of the vertical axis of a thermometer. Teachers should teach both abstract and concrete concepts in class.

I would rate this article a 1.5 on usefulness since the author provided over 50 methods of application for classroom usefulness and several example. The reason for the 0.5 is because some of the examples are less developed and would need significant planning to implement, although they are still very useful tools.

The suggestions provided are great starting places and could be applied with a little research on the teachers’ part. To use this tool, I would need to invent grading that would be fair with many different student responses. Example 7.3, designing kitchen tools is very abstract and students would need to justify their responses, solutions can vary drastically. Many applications require background knowledge of various topics. Teaching students to research required prior knowledge is an opportunity to incorporate reading into a math classroom.


The Fibonacci sequence is a list of numbers starting with 1, 1 and then each number is the sum of the previous two numbers to create the sequence \{1, 1, 2, 3, 5, 8, 13, 21, \ldots\}. The sequence is valued throughout mathematics and the author suggests combining poetry with the sequence. The author suggests using the Fibonacci sequence as syllables to create Haiku-like poems to describe mathematical
ideas like adding, subtracting and multiplying. They also suggest the use of other sequences such as odd and even numbers as well as other subjects when building poems.

Within a high school math classroom, I would rate the usefulness of this article 3, indicating that this should not be taught in high school math classrooms. The Fibonacci sequence itself is insignificant for understanding most mathematics, what is important is the construction of the sequence, not necessarily the use of such sequences.

Writing Fibbin poems may serve well in an English classroom where literacy teachers encourage students to use precise language to build well-planned, complex sentences. Teachers engaging on cross-disciplinary practices, such as elementary school teachers, may find this tool useful, but within my classroom, where math concepts are taught Fibbin poems have little value. I claim there is no value because the language taught is not math related and does not contribute to mathematical understanding, rather this is a project for poetry, which incorporates math concepts.


Robert P. Moses, a civil rights activist and teacher, stated an algebra program called The Algebra Project to improve access to higher levels of math and science. The mission is to increase math literacy in high schools, since math is essential in a computer based world. Through the project, Moses calls for elementary teachers to have higher math standards, so even younger students can access math. Finally, The Algebra Project encourages students to teach each other since peer teaching improves understanding and is an important through life.

Within the article, Checkley describes how math is a formal language in which is not commonly spoken. I would rate the idea of teaching math as a language as a 1! Reading and writing mathematically is vital for the future and there is money in math literacy, especially within technology. I support the teaching of computer languages. Writing computer code is an amazing way to ensure that students are learning to think mathematically. If students write computer code, which lacks proper mathematical language, the program will fail to execute the command.
Within my classroom, I hope to use computer programming to motivate my students to learn algebra using many examples along the way. Teaching concepts in a more accessible way, such as a subway ride to represent relative direction from a starting point can provide tools for learning. Finally, this article provides motivation for teachers to never accept student failure in algebra since it is essential for today’s world.


“Constructivism is the philosophy, or belief, that learners create their own knowledge based on interactions with their environment including their interactions with other people” (p.522). The Constructivist approach is supported by literacy techniques and reading juicy texts with careful attention to details. This author suggests using techniques such as DR-TA or KWL to assist students in pre-, during-, and post-reading strategies. In all, the text is a call to action for math teachers to use literary techniques to help students understand course content.

The utility of this text is 1 because they make many suggestions for integrating comprehension techniques for dense and detailed mathematical texts. They support their claims with several examples to be used by teachers.

When helping students build understanding of complex texts, I hope to use a wide variety of texts to introduce real world experiences within my classroom and build on students knowledge in a truly constructivist way. In doing so, the text will provide support to content area work and aid understanding and build meaning for math concepts through texts.


Using emerging technologies in the classroom is becoming more common, especially free resources such as online blogging. This article discusses Mr. K’s Pre-Calculus class blog to engage learners and create high levels of contribution and student voice for his class. The blog was used as a review, documenting classroom activities and also provided a place for reflection. The online writing
was meaningful for the students because there was a real audience to read the posts and students were creating a “textbook for the world.” The use of a class blog encouraged collaborative learning space and helped students further engage with class material outside of the classroom.

The utility of this article is 1. I could immediately implement this within my classroom because of easy access for students and free engagement using collaborative learning as a basis for the blogs.

One potential drawback for this tool would be student access to computers or Internet at home. Students with no home computer could be disadvantaged by the integration of this technology. However, the concept is so strong that students would be able to use some class time to reflect on their learning. To fully use this technology, I would make small adjustments to fit my specific classroom needs, potentially using the source of additional resources for students or classroom feedback too!


Mathematics can be an overwhelming topic, especially for students who are struggling to understand concepts. Mancil and Maynard suggest four concepts teachers can take to improve student behavior caused through instructional methods specifically for teaching math. First, they suggest modifying content, namely the amount of problems for students. Second, if teachers modify their behavior by repeating of simplifying instructions and information for student comprehension. Third, for students challenged with the task at hand providing alternate methods of displaying knowledge (oral rather than written), students may behave better. Finally, they suggest changing the delivery system, incorporating both lecture- and computer-based instruction.

These concepts would rank a 1 in usefulness because of their easy adaptability in a classroom. Techniques such as restating information and simplifying instruction could be easily be adapted for secondary math and are good practices for long-term storage. Teachers who define and then use mathematical language or vocabulary help students retain information.

Many techniques are very useful for struggling students and especially useful for students with IEP’s. For algebra topics, task cards can be useful for teaching algorithmic processes, these help students
understand the patterns used for solving problems. Also, a general tool for keeping students on track is student summarization. Asking select students to summarize the task keeps them engaged during instruction and knowledgeable during independent practice.


“Cyberinfrastructure refers to a broad informational network with connections to real-time data sensors as well as tools that permit visualization and other forms of analysis, and that facilitate access to vast scientific databases” (p.19). When available to students, the cyberinfrastructure provides more learning in science fields by eliminating the *canned* presentation of science data that always works. In this way, students are more cognitively engaged and act as real world scientists contributing to the data and analysis pool. This network of information also works to freely share data with the scientific community.

Providing students with real world information and learning how to sift through that information is an incredibly useful tool in both math and science, which is why I gave the content of the article a score of 1. On the other hand, gaining access to the network of information seems challenging or expensive to gain access, which is a deterrent for a teacher to use.

Within my classroom, I plan on using real world data, with all the bumps and bruises that come with real data from the real world. Particularly when teaching a science related topic, such as exponential growth, students should see how populations of bacteria grow in a petri dish to model the mathematical function, a database such as the proposed cyberinfrastructure could provide the necessary network to model the math. I hope to use various sources of data (airplane geolocations, football throws, stock data over time) to introduce concepts as they apply to math. This can assist science teachers who wish to go further in scientific analysis since students will have practice working with real sources of data.

Math literacy is said to be associated with gender, family income and other factors however in this study, Özgen and Bindak study how student efficacy is related to student success and their statistical study contributes data to show that students from various backgrounds have different levels of self-efficacy. All are directly correlated with one another. This article emphasizes Math Literacy as use of Mathematical thought, building understanding and independent skills in problems solving consistent with the goals of the National Council of Teachers of Mathematics (NCTM). Results indicate that males have more self-efficacy than females, 9th graders more than 12th graders, successful parents more than low socioeconomic status parents and higher self efficacy rates among those who pay attention in class over those who do not pay attention in class (not a big surprise).

While most of the data presented in this article is useful in understanding self-efficacy in student groups and the correlation with math literacy, the text does not suggest any tools for teachers to use the data within the classroom. Because the text lacks suggestions for improving math literacy, I rate the usefulness 2.

To attempt to impact students, I hope to build confidence levels among those identified in the article as high risk for low self-efficacy, especially among women and low socioeconomic status students. More importantly, sharing with students the research behind classroom attention and math literacy may help students be more engaged and confident in their math skills. Additionally, I will provide students with opportunities to problems solve in the real world and support their efforts in working towards math literacy.


Math and literacy teacher learning to work together to improve math instruction by addressing student deficiencies in literary tools. The article provides a description of a project where math teachers and literacy coaches develop tools to help students decode dense math texts. The article provides
examples including vocabulary workshops decoding prefixes. Other tools include graphic organizers, using root words to understand meaning, and learning directional words to generate meaning.

This article is rated 1 because of the simple utility within a classroom. Vocabulary words can be integrated and math teachers can easily break down meaning of jam-packed texts into easy to understand chunks.

The most useful elements of this article are the realizations of both math and literacy teachers about the connections between their subjects. Lesson planning and interdisciplinary tools can be shared among math, science and English teachers to support students. In schools with large bilingual populations, teacher relationships can be formed to incorporate English Language learning into math classrooms too!


Singer discusses the importance of Discourse Time for students, particularly in a math classroom, to help students develop a deeper conceptual understanding of mathematical ideas and act as a true mathematician. The article discusses the process of creating productive discourse times (D.T.) in a math class to emphasize the use of sources for supporting arguments. Teachers are discouraged from grading students’ contributions for correctness as this deters valuable student responses. Additionally, Singer gives examples of student roles and models a teacher’s response to a D.T. for students working through “The Boat Race” problem in class.

I would rate the accessibility of this technique in a math classroom a 2. Using D.T. in a math classroom seems to have utility, however, Singer does a poor job at aiding potential adopters to tools for choosing questions, which help students elaborate. On the other hand, creating discussion around a math topic is a mathematician’s dream! By arguing, contributing new or unique ideas, even if they are wrong, always contributes to deeper understanding and helps students become resourceful speaker. Peer input is important to refute incorrect ideas or support accurate solutions.
Discourse Time does have a lot of value, however, the technique presented does not seem to fit my teaching style. The structure of Singer’s D.T. is too formal and students feel graded which is not part of true mathematical discourse. Rather, I hope to provide students with challenging, open ended questions, one in which may not have a correct solution, and sprout organic debate and conversation within a class discussion. This may happen at the beginning of the class after an opening question or may take place during formal instruction.