

Retaining Rigor with Technology

Rigor and relevance...rigor and relevance. How many times have we heard that phrase and been challenged that our instruction must include both? As Dan Koch once said: "Having more computers or iPads in the classroom doesn't make it cutting edge, [a] shift in pedagogy is key" (https://www.bamradionetwork.com/quoted/author_quotes/422-dan-koch-%EF%A3%BF). I believe part of the shift he is describing is the key role librarians can play in utilizing technology to maintain, and even expand, the rigor of collaborative instruction. This quote also outlines one of our key challenges as 21st-century media specialists—just how do we best implement instructional technology to retain rigor?

The SAMR model, developed by Dr. Ruben Puentedura, offers us some guidance in maintaining rigor—defined as "the quality of being thorough, exhaustive, and accurate"—through instructional technology (2013). In the SAMR model, teachers are challenged to push their instruction from the Substitution level (such as merely replacing a paper worksheet with an electronic one or having students type their notes instead of taking them by hand) and move toward the Redefinition level where students are engaged in tasks that the technology for the first time makes possible.

So if we are to maintain rigor through the use of technology, what steps must we take? As Eric Sheneringer and Weston Hieschnick suggest, it requires a higher level of planning and preparation to facilitate this redefined instruction. Just because something is difficult, that doesn't mean it is rigorous. If we are to maintain and add to the rigor of our instruction through technology, as teachers and librarians we must also provide additional supports for our learners. We must set up mechanisms along the way to give frequent feedback to our students to inspire them to keep moving forward. Maintaining rigor while using technology also means that instruction, while based in content, must have broader purposes and applications beyond just the classroom. For students to experience success in such an environment, they need to be engaged. Throughout such rigorous instruction, students also require opportunities to demonstrate their learning.

Using Technology to Increase Rigor

Technology can be a great tool to increase the level of rigor in instruction. But technology by itself is not the answer. If we do not also adjust our pedagogy, we merely add more technology to our learning spaces and will remain stuck at the Substitution level of SAMR. One advantage of using technology is that it can be used to add multiple steps, which can increase the rigor of learning activities. It can also be used to inject creativity, collaboration, and project management skills as well as opportunities for students to build their written and oral communication skills. Technology can provide a more student-centered focus including student-developed questions and more authentic assessment opportunities than what pencil and paper could provide.

One such example of this is a collaborative project I planned with the Spanish for Native Speakers teacher in my building. Students were presented with the real world question: "Which institutions in our city best represent our cultural heritage?" The students then had to decide between using Fakebook or Google Tour Builder to devise a tour of cultural landmarks in our city. They had to research which locations they felt "belonged" on their tour and develop consensus with their peers. Student groups had to chart a path around the community, select images of landmarks, and develop written descriptions for their tours. The project also required them to use design principles to create an aesthetically appealing virtual environment for their tour and selected media.

They needed teacher and librarian guidance to find the best media sources to highlight their chosen cultural institutions and to cite the media sources correctly. In this way, technology tools can be used to provide more authentic assessments answering important real life questions, compared to pencil and paper tasks.

Application of Technology—Adding Rigor to Instruction Principles

Here are a couple of additional examples of using technology to maintain rigor:

Google a Week

I run a weekly contest called Google a Week. In this challenge, students are encouraged to do some research in order to answer a trivia question related to the curriculum or current events. One correct answer is drawn out of the collected entries weekly and that individual has their name posted on the daily school video broadcast. The winner also receives a large chocolate bar and an invitation to the Google a Week Championships that happen in the spring.



For the last two years, about a dozen of the year's winners have gathered in the library at lunch to compete in the Google a Week Championships; students who did not qualify often ask if they can come up and watch the championships. At the event, each student is given a laptop with Google Earth access and connected to one of the library's television screens. Students also use their Chromebooks to access the questions as well as the Google Form where they submit their answers.

The championships are filled with challenging questions about world geography and the prizes for the winners are equally amped up for the competition. Each student has to locate the answers by using Google Earth's standard and street view features, their knowledge of geography, *and* supplement this with Google searches (app smashing). This lesson highlights the use of multiple layers of technology to enhance rigor in order to synthesize conclusions.

Both years I have run the contest, not one of the student participants has left once our thirty minute lunch period has ended. In fact, ten minutes into the next class period, I have to remind them to go to class, not because they are just sitting there staring off into space, but because they are so fully engrossed in the competition. And, it is not just the academic achievers and pre-Advanced Placement learners, but also second-language learners and the self-contained participants—all students are THAT engaged in the activity! This is a powerful example of using technology to maintain rigor: students have

to acquire information from multiple sources and technology tools in a competitive environment.

Google Hangouts

At face value, participating in a Google Hangout with an expert or a class from another part of the world might not appear to be a Redefinition level activity with a high level of rigor. However, when teachers and librarians effectively prepare students by having them do research about the guest speaker or the country of the other participating class and have students construct their own questions, this becomes a rigorous and engaging activity at the Redefinition level of the SAMR model. Using the knowledge gained from their research, students can create questions that reflect a synthesized knowledge of the topic and understanding from a first-person's point of view.

When technology is used with these goals in mind, it can, as Eric Patnoudes says, "act like rocket fuel" for our lessons, propelling both greater student engagement and memorable learning experiences.

Evolving from Substitution to Redefinition (SAMR) via Technology and Thought

There are many curriculum examples we could spotlight where "posters" are made as various knowledge products. One example would be a "career poster." Migrating this to an online version is an example of a lesson at the Substitution level of SAMR. Instead of pasting images and text onto a print poster, the physical poster is replaced with an online poster-making app or website. To add rigor, media specialists could instruct students on finding Creative Commons images for the poster. But, how much better would it be to work with students to develop questions for a person who already works in that field and help connect students with these individuals through email or Google Hangouts? Interacting with those who work in these fields provides more depth and student-centered results, giving students more to deeply consider when contemplating careers.

Vocabulary Charting in Google Docs

This is the classic paper lesson redone with technology in Google Docs where students use Google instead of Webster's dictionary to look up a word's definition and add it to the chart instead of writing it out, find a picture instead of drawing it, and using the word in a sentence (where hopefully the sentence is not: "I have no idea what [pontificate] means").

This activity, even when using the research tool(s) in Google Docs, is still at the Substitution—or possibly Augmentation—level of SAMR. So, how could this lesson use technology to add rigor? Could some multisensory elements be added so students could hear the words in their productive vocabulary, or could students see their work in print creations used correctly? Could peer feedback and comments about their vocabulary charts or use of the vocabulary terms in context be vetted by peers on their Google Docs? When a social element is added, the value of the assignment increases and students will take the task more seriously. This in itself adds rigor and usually shows more evidence of their learning.

Collaborating with teachers to amp-up the rigor of their lessons via technology is a great way for media specialists to demonstrate leadership in instructional technology. It is also a great opportunity to develop long-term, cross-curricular learning experiences for our students, increasing student ownership.

Sheninger and Kieschnick describe the long-term impacts of the proper usage of technology to add rigor: "When technology is integrated with purpose and aligned to the acquisition of new knowledge, the demonstration of conceptual mastery, or the acquisition of new skills, more authentic learning will take place and students will be better equipped to compete in the real world." Aren't these the very things we as 21st-century librarians are all about?

Works Cited

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Characteristics of rigorous teaching with technology

High levels of student engagement

Students engaged in learning, doing, and reflecting

Focus on skill mastery

- critical thinking
- problem solving
- creativity
- collaboration
- project management
- written/oral communication

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