LEARNING APPS FOR RIGOR AND RELEVANCE

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Technology can enhance instruction and student achievement, if used effectively. By using the Rigor/Relevance Framework and related strategies, teachers can ensure that technology leads to more rigorous and relevance student learning.
When technology was first introduced into schools, the conversation was about hardware and software. Hardware was the devices we learned to operate, and software was the internal commands and procedures that enabled the user to write, create, and browse the World Wide Web. As technology has become more ubiquitous, the devices are much smaller and more mobile. Today, apps are the way we use technology. These apps, short for the word application, are single purpose software applications that are easy to learn. Apps are also low-cost and provide convenient ways for teachers and students to learn, reflect, and produce student work.

Teachers are well aware of the engaging aspect of technology and apps. Particularly, when these apps are on smartphone devices, students are very quick to learn and use the apps. Students may already be using similar apps as part of their daily lives to communicate with friends, play games, listen to music, or watch videos. Students take to apps very quickly. Therefore, it is a naturally engaging strategy for teachers to bring mobile technology and apps to the classroom. Students show interest and can quickly learn to use the learning app. If these apps are well constructed, it can quickly lead to a powerful learning experience. Teachers can reap the positive benefits of having students more engaged in their learning by introducing apps. However, student engagement is only an intermediate goal. It is nice to have students engaged, and they are more likely to learn if they are engaged, but the ultimate goal is student learning.

Teachers need to make sound judgments about the apps that they select and determine whether the apps are just keeping students busy and away from serious disruptions or whether students are learning. Further, teachers need to reflect whether learning is simply memorizing low-level facts or it is really challenging students to higher-level thinking skills? One of the best tools that describe higher levels of learning and moving toward rigor and relevance is the Rigor/Relevance Framework™ from the International Center for Leadership in Education. This framework defines Quadrant D as the learning that reflects high rigor and high relevance. In the classroom, it is still important for students to learn foundation skills and basic information which are described as Quadrant A learning. Students can't perform at high levels of rigor allow relevance unless they have acquired the foundation skills. However, students should not be held hostage of continuing to repeat instruction in low rigor/low relevance and never have an opportunity to begin to be challenged by high rigor/high relevant experiences.
As teachers define and create a lesson plan, they should identify the level of rigor and relevance they want their students to achieve. The goal is to have students challenged with problems that reflect the analytical and creative thinking and apply to complex real-world problems. Relevant learning is the test of deep learning when students are asked to apply their learning to very challenging problems.

Likewise, when teachers are selecting apps to bring into the classroom, there may be an opportunity for low rigor/low relevance apps which help students learn basic foundation skills. However, the more dynamic aspect of raising the level of instruction is for teachers to think about apps that parallel quadrant D of the Rigor/Relevance Framework. This publication describes some current education apps that align with high rigor/high relevance.

**Rigor/Relevance Framework**

A four-quadrant model for teaching and learning is the Rigor/Relevance Framework™ from the International Center for Leadership in Education. This framework quantifies the aspirational goal of rigor and relevance and gives teachers a way to raise, over time, the level of instruction and assessment to achieve the High Rigor/High Relevance learning. This mental model for teaching and learning is a powerful tool for instructional leaders to use as an agenda for a conversation with teachers about instruction. It applies to any grade level and any subject area and provides a common language for raising expectations, engaging students and results in deeper learning. To learn more about the Rigor/Relevance Framework, consult any of the several publications from the International Center for Leadership in Education.

The Rigor/Relevance Framework is composed of two scales. The Knowledge Taxonomy or Bloom’s Taxonomy, as it is often known, familiar to most teachers. Every teacher that have had education courses, has been introduced to the six levels of increasing complexity of cognition. Many academic teachers are comfortable about raising the level of their instruction in parallel with Bloom’s taxonomy, and perhaps even a few CTE teachers have thought about this. When introducing the Bloom’s Taxonomy scale, have teachers brainstorm or discuss aspects of their curriculum and instruction where they are elevating the level of knowledge and student complexity in thinking.

The second scale that makes up the Rigor/Relevance Framework is the Application Model which created by the International Center for Leadership in Education. It describes the increasing complexity regarding application of knowledge and skill. Just as teachers might scale their instruction from low levels of Bloom’s Taxonomy to high levels, the same can be done for low levels of application to high levels of application. This represents increasing Relevance.

Once teachers are familiar with the Rigor/Relevance Framework, it is easier not to focus in on the details of the six or five scale level, but simply think about the four quadrants that are created by simply dividing high and low on Bloom’s Taxonomy and high and low on the Application Model. This creates the four quadrants of the Rigor/Relevance Framework.
Quadrant D Strategies

Several publications from the International Center For Leadership in Education identify some instructional strategies, which teachers can use to raise the level of rigor and relevance. Following is a list of 18 of the strategies that are particularly powerful in taking students to Quadrant D learning. This publication uses these 18 strategies as an organizer for identifying apps in education, which teachers can use to not only engage students but move the level of learning to high rigor high relevance.

- **Artistic Expression** is producing visual, dramatic or musical performances to express ideas, thoughts, and concepts.

- **Brainstorming** stimulates thinking and allows students to generate vast amounts of information and then sort that information in an engaging learning process.

- **Cooperative Learning** places students in structured groups to solve problems by working cooperatively.

- **Digital Media Production** is students expressing knowledge, ideas, and concepts in the form of digital audio, video and animation.

- **Feedback and Reflection** involve teachers directing student learning by giving feedback, checking for understanding, and encouraging reflection.

- **Inquiry** engages students in posing questions around an intriguing investigation, making observations, and discussing them.

- **Instructional technology** – Any Time is using internet connected digital technology for asynchronous interactive learning, including web browsing, wikis, blogs, and social networking tools.

- **Logical and Independent Thinking** is thinking deeply and about an issue, taking a point of view, developing a logical argument and defending a position.

- **Play** is to voluntarily engage in intrinsically motivated, unstructured activities that impart joy, self-expression, and experimentation in which rules and goals influenced by interpersonal interaction and imagination.

- **Presentations/exhibitions** are oral presentations by students requiring them to organize ideas and express them in their words.

- **Problem-based Learning** introduces concepts through the use of problem-solving skills on areal problem or investigation.

- **Project Design** requires students to integrate their skills and knowledge to create their own literary, technological, or artistic work, as individuals or in a group.
Research means students locate and retrieve information from several sources, such as library references, textbooks, other individuals, and electronic databases via the Internet.

Simulation/Role Playing replicates the way skills or knowledge are used outside the school, ranging from role-playing to computer-generated virtual reality.

Storytelling is students conveying of events, ideas or concept in words, images, and sounds through improvised narration.

Teacher Questions stimulate significant student thinking in response to thoughtful queries about connections with new information.

Teaching Others allows students to deepen knowledge through peer teaching or teaching younger students.

Writing to Learn makes students organize their knowledge and reinforces concepts in any form from short quick writes to multi-page research reports.

Learning Styles and Multiple Intelligences

Every student learns differently! If teachers are to be effective facilitators of every student reaching a level of proficiency, they need to incorporate a variety of strategies. By using a variety of strategies, teachers not only are more likely to enable each student to learn but it creates more interesting and engaging instruction. In this discussion of apps for teaching strategies, it is appropriate to analyze each of these strategies regarding its relationship to learning styles and multiple intelligence. Learning styles is divided into two categories. First is Sensory Mode. This distinguishes the preference that students have for the senses they are most comfortably use to acquire new learning. The common categories of Sensory Modes of learning styles are; visual, auditory, tactile and kinesthetic. Table 1 shows the relationship of each of these D-moment strategies in relations to these four sensory modes.
The second aspect of learning styles is the preferred thinking mode of students to process the new learning. Two common dimensions of thinking defined by Anthony Gregorc are whether students rely on more concrete thinking or more abstract thinking and whether they are more sequential in thinking or more random. Four broad categories of thinking styles are listed below based on these two variables.

- **Concrete-Sequential learners** are well organized, enjoy recalling and constructing correct responses, are consistent and focused on learning.

- **Abstract-Sequential learners** are analytical thinkers, follow traditional instruction and are comfortable working alone and giving long answers.

- **Concrete-Random learners** respond to opportunities to be creative and design products, are usually self-directed, and like to experiment.

- **Abstract-Random learners** respond to creative learning activities and prefer working with others in a collaborative environment and are frequently difficult to keep on task.

Table 2. shows each of the D-moment strategies about these thinking preferences of learning styles.

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Howard Gardner's Multiple Intelligence theory has become a classical model by which to understand and teach many aspects of human intelligence. This list has evolved into nine current intelligences. Intelligences are not the same as learning styles although there are some similarities in terms. Learning styles relate to the preferences that individuals have to take in and processing new knowledge and skills. Multiple intelligences refers to the innate gifts some individuals have to learn difference knowledge and skills. These intelligences explain how individuals show strong interests and increased abilities to learn certain skills and knowledge. Many psychologists debate the physiological existence of different intelligences. However, educators know from experience that students demonstrate these different intelligences on a daily basis. The nice intelligences are:

- Verbal/Linguistic - naturally good with writing or speaking and memorization.
- Logical/Mathematical - driven by logic and reasoning.
- Visual/Spatial - good at remembering images and are aware of surroundings.
- Bodily/Kinesthetic - love movement, have good motor skills and are aware of their bodies.
- Musical - musically gifted and have a "good ear" for rhythm and composition.
- Intrapersonal - adept at looking inward.

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<th>Table 2 Quad D Strategies and Thinking Modes of Learning Styles</th>
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• Interpersonal - good with people and thrive in social interactions.
• Naturalist - sensitivity to and appreciation for nature.
• Existential – likes to ponder, question and think about “big picture” and mysteries of life.

Awareness of these intelligences and relating these to the D-moment strategies can help teachers recognize how students will respond and engage in these strategies and where some students will need more time or assistance to learn.

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DRAFT LIST OF APPS

The following are a draft list of apps appropriate for teaching for high rigor/high relevance, defined by the Quadrant D of the Rigor/Relevance Framework. Apps are grouped by the related instructional strategy.
**ARTISTIC EXPRESSION**
- EduCreations
- Show Me
- Whiteboard Pro
- Sync Space

**BRAINSTORMING**
- Inspiration Maps
- iBrainstorm
- iBlueSky
- Spiderscribe Jr.
- Lino
- Stormboard
- Penultimate
- Mindo
- iCard Sort
- MindMeister
- Maptini
- Mindmup

**COOPERATIVE LEARNING**
- Buncee
- Conference Pad
- Group Board
- Team Viewer
- Join Me
- Air Sketch
- Screen Chomp

**DIGITAL MEDIA PRODUCTION**
- iMovie
- Adobe Capture
- Adobe Ideas
- Animoto
- iPadio
- Super City Build a Story

**FEEDBACK AND REFLECTION**
- Notability
- Paper Desk Lite
- Classkick
- Ideament
- Evernote
- Mobile Noter

**INQUIRY**
- Grid Diary
- Note Taker HD
- GoodNotes
- ABC Notes
- Popplet
- Ghost Write Notes
RESEARCH
- Pubget
- iSource
- Kiosko
- Instagrok
- Awesome Note
- EBSCOhost
- Flipster

STORYTELLING
- Telestory
- Tellagami
- Lark
- StoryKit

TEACHING
- OTHERS
  - Book Creator
  - StoryBoard That
  - Explain Everything
  - Kahn Academy

SIMULATION/ROLE/PLAYING
- Infinity Blade
- Flashcards
- Classcraft
- Let’s Be Social
- Bloxels

TEACHER QUESTIONS
- Replay Note
- Kahoot
- Socrative
- Slack

WRITING TO LEARN
- iTrace
- Sentence Builder
- Boom Writer
- iCan Write
- Clean Writer
Brainstorming stimulates thinking and allows students to generate vast amounts of information and then sort that information in an engaging learning process. Brainstorming stimulates student thinking and encourages students to seek ideas beyond a single right answer. Brainstorming is often used as a starting activity with other strategies such as inquiry, problem-based learning, or project learning.
StormBoard

How it Works

*Stormboard* converts into digital world the activity of brainstorming with individual Post-it notes on a large board to summarize brainstormed ideas. Brainstorming in a digital form offers several advantages. Students type on their own virtual Post-it note and move those to a wall for the entire class to see.

Each student is registered by name into the app, which enables the teacher to see who authored each particular item. Brainstorming can be in a blank open format or there are several templates which can be used to structure the brainstorming. Once brainstorming is completed items can be visually grouped and sorted. Students can also rate ideas by voting on their app and best ideas can then be ranked.

Description

- **Developed by:** Edistorm
- **Use it with:**
  - Apple
  - Android
  - Also, can be used with internet browser
- **Level**
  - Grade 4 to Adult
- **Costs are:**
  - App Free, $10 a month standard pricing, free for small teams, offers special education pricing.
Each student and the teacher display can view the brainstormed ideas as presented live. In addition, there are a number of reports which can be generated from the brainstormed items. Reports can be in the form of a Word document, spreadsheet or even a Wordle. Because of the identification of author and ranking of items, these reports can be very powerful resources for using the brainstorm content.

Brainstorming can occur simultaneously or can be done by individual students over time. Brainstorms can be saved for future use.

**Why this App Supports Brainstorming**

The objectives of brainstorming are to generate many ideas and defer judgment of those ideas to a later time. With students individually using an app to record their ideas, it is possible to engage many students at the same time compared to having students orally brainstorm their ideas one at a time. Also, some students may be more comfortable writing down their ideas in this app rather than verbally offering their ideas.

There is always the problem of who records and transcribes the suggested ideas. One of the burdens of brainstorming is often transferring ideas from a whiteboard or chart paper into a document that can be edited. The app facilitates this process by creating all of the brainstormed items in a digital format.

In brainstorming, many new ideas come from connections of what other students have suggested. Using this app, students can continually see on their
own eyes what other students have suggested and this may trigger their own new ideas to add.

**Why this App Increases Rigor and Relevance**

Brainstorming supports relevance because it builds upon student knowledge. When students offer an idea in a brainstorming discussion, their ideas are recorded and validated which helps to strengthen the connection between a student’s knowledge and the existing lesson objective. Even if that student suggestion is deleted at a later time, the act of brainstorming helps to build student perception of relevance of the curriculum to their own prior knowledge.

Rigor requires student critical thinkings. Brainstorming encourages students to think beyond a single right answer and consider other possibilities, this is one form of critical thinking. Critical thinking is further supported in this brainstorming app when students are asked to rate other student responses and analyze ideas comparing and prioritizing those that are most relevant to the learning task at hand.

**Ways to Use It**

Using an app such as *Stormboard* in brainstorming creates a much more efficient way to conduct brainstorming and engage all students simultaneously. Brainstorming is rarely a total strategy for a particular lesson but often used in conjunction with another strategy such as inquiry or problem-based learning.

- Brainstorm ideas for a problem-based lesson
- Collect and summarize live data and charts for mathematics instruction
- Brainstorm criteria for creating an assessment rubric
- Give feedback or rate on a student presentation
- Brainstorm ideas as part of an inquiry
- Consider optional designs for student projects
- Summarize characters from a book