READING FOR INSTRUCTIONAL ROUNDS AT BEROWRA PS T1 2024

The Call for Rigor

There have been calls to increase rigor for many, many years. However, in recent years, there has been a renewed emphasis. This has come from an understanding that all our students will need higher-order skills to be employable in the future; and a concern that our PISA results have not kept pace with other countries. These have shown us we need to re-evaluate what we are doing in terms of rigor.

Extracts from NSW Curriculum Review, NESA, 2020

From 2000, Australia participated in the OECD's Programme for International Student Assessment (PISA) – an assessment of reading literacy, mathematical literacy and scientific literacy at 15 years of age. Rather than testing basic skills, PISA assessed students' abilities to apply their knowledge and skills in reading, mathematics and science to a range of real-world problems. In this sense, it assessed higher-order academic skills. Australian students' performances on PISA declined significantly between 2000 and 2015, both in an absolute sense and relative to average performance in all OECD countries. PISA indicated a significant longer-term and continuing decline in 15-year olds' understandings of how to ***apply*** *basic reading, mathematical and scientific knowledge and skills in practical situations.*

Mathematics

There are also three shifts related to mathematical thinking:

Focus: Focus strongly on where the curriculum focuses	• Focusing deeply on the major work of each level will allow students to secure the mathematical foundations, conceptual understanding, procedural skill and fluency, and the ability to apply the maths they've learned to all kinds of problems – inside and outside the maths classroom.
Coherence: Designing learning around coherent progressions level to level	• Create coherent progressions in the content within and across levels, so that students can build new understanding onto previous foundations. That way, instructors can count on students having conceptual understanding of core concepts.
Rigor: Pursuing conceptual understanding, procedural skill & fluency, and application all with equal intensity	• Conceptual understanding of key concepts, procedural skill and fluency, and rigorous application of mathematics in real-world contexts.

Too often in mathematics, debates centre on procedures or concepts. When answering a division of fractions problem, 1/3 divided by 4/5, rather than only (a) understanding that 4/5 is larger than 1/3 so that answer will be less than one or (b) how to robotically invert and multiply, it is important that students understand both the reasoning and procedures for dividing four-fifths into one-third. As such the student may realise that using equivalent fractions makes better sense in this problem, 5/15divided by 12/15 = ?, answer 5/12. Holding higher expectations for all students will have a profound impact on their long-term growth and development as seen through academic and behavioural performance.

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Essential to school learning is the development of increasingly deep understandings of core concepts and principles in an area of learning, around which factual and procedural knowledge is organised.

Learning for understanding can be contrasted with the superficial memorisation of facts and procedures .....this can be the outcome when curricula specify large amounts of material to be learnt, focus on the performance of specific tasks or are based on checklists of outcomes or skills... Learning for understanding is further compromised when assessment processes prioritise the testing of facts and skills over assessments of thinking and understanding.

Learning based only on following specified routines, reproducing provided information and/or performing low-level tasks is particularly detrimental if it limits opportunities and quality of learning for particular groups of students. Learning with understanding must be an objective for every student if they are to be well prepared for life and work in an increasingly knowledge-based society

The Beginner's Guide to Understanding Rigor - Barbara R. Blackburn

When I am in schools working with teachers, I'm often asked why I care about rigor. They are also quick to tell me they care about rigor because they are told they have to. My response is simple. There are other reasons, such as the clear research base that shows our students need more rigor, the new Common Core Standards that require more rigor, or the number of students who graduate from high school ill-prepared for college or the workforce.

But my most important reason is this: rigor is not about giving students more to do, or punishing them with more homework. Rigor is about helping students learn at higher levels, and that's why I became a teacher.

Defining Rigor

My definition of rigor has a sharp focus on instruction: creating an environment in which: each student is expected to learn at high levels, each student is supported so he or she can learn at high levels, and each student demonstrates learning at high levels.

Notice we are looking at the environment you create. The tri-fold approach to rigor is not limited to the curriculum students are expected to learn. It is more than a specific lesson or instructional strategy. It is deeper than what a student says or does in response to a lesson. True rigor is the result of weaving together all elements of schooling to raise students to higher levels of learning. Let's take a deeper look at the three aspects of the definition.

Expecting Students to Learn at High Levels

Rigor is creating an environment in which each student is expected to learn at high levels. Having high expectations starts with the decision that every student possesses the potential to be his or her best, no matter what. As you design lessons that incorporate more rigorous opportunities for learning, you will want to consider the questions that are embedded in the instruction. Higher-level questioning is an integral part of a rigorous classroom. Look for open-ended questions, ones that are at the higher levels of Bloom's Taxonomy and Webb's DOK. It is also important to look at how teachers respond to student questions. When I visit schools, it is not uncommon to see teachers who ask higher-level questions. But I then see some of the same teachers accept low-level responses from students. In rigorous classrooms teachers push

students to respond at high levels. They ask extending questions. If a student does not know the answer, the teacher continues to probe and guide the student to an appropriate answer, rather than moving on to the next student.

Supporting Students to Learn at High Levels

High expectations are important, but the most rigorous schools assure that each student is supported so he or she can learn at high levels, which is the second part of our definition. It is essential that teachers design lessons that move students to more challenging work while simultaneously providing ongoing scaffolding to support students' learning as they move to those higher levels. Providing additional scaffolding throughout lessons is one of the most important ways to support students. This can occur in a variety of ways, but it requires that teachers ask themselves during every step of their lesson, "What extra support might my students need?

Ensuring Students Demonstrate Learning at High Levels

The third component of a rigorous classroom provides each student with opportunities to demonstrate learning at high levels. What I've learned is that if we want students to show us they understand what they learned at a high level, we also need to provide opportunities for students to demonstrate they have truly mastered that learning. One way to accomplish that is through increased student engagement. Options include requiring all students to respond either through pair-share, thumbs up or down, writing an answer on small whiteboards and sharing their response, or responding on a handheld computer that tallies responses. Such activities hold each student accountable for demonstrating their understanding.

BELIEFS THAT SUPPORT RIGOROUS INSTRUCTION

• Rigor is not a negative concept. It is about meeting students where they are in their learning process and helping them move to a higher level of learning.

• Every student should be given the opportunity to learn at high levels.

• Students are more likely to succeed if they are held to high expectations and provided appropriate encouragement and support.

• Rigor may "look" different for different students, but all students can master complex, high-order skills and concepts.

• Students need varying levels of support as they move to more rigorous work.

• A classroom environment that promotes student motivation, student ownership and empowerment, and a growth mindset is critical.

SOME MYTHS ABOUT RIGOR - BLACKBURN

Myth #1: Lots of Homework Is a Sign of Rigor

For many people this is the most prevalent indicator. Many teachers are proud of the amount of homework they expect of their students. It is often built on the idea that "more is better."

Unfortunately the evidence is that "more" often means doing more low-level activities, often repetition of things done earlier. Because students learn differently, it is important to vary the instruction with the student and to use homework strategically, as an opportunity to deepen understanding of what has been learned.

Myth #2: Rigor Means Doing More

There is also a belief that students need to do more than they are currently doing. Tony Wagner of Harvard found that classrooms are often characterized by low-level, rote activity. A study by Howard Johnston and Ronald Williamson (my co-author on *Rigorous Schools* and *Classrooms and Rigor in Your Schoo*l) found that *parents* saw rigor as doing less but *doing it more in-depth*. That is often difficult for principals to reconcile when talking with teachers and other school personnel who may take a different view.

True rigor is expecting every student to learn and perform at high levels and requires that students delve deeply into their learning, engage in critical thinking and problem solving, and be curious and imaginative.

Myth #3: Rigor Is Not for Everyone

There is a belief that if everyone is engaging in rigorous activity, it somehow lowers standards and lessens the value. It shouldn't. There is growing recognition that all students must be provided an opportunity for a rigorous educational experience that is more than just a set of courses. It is anchored in the belief that every student can be successful if given adequate time and sufficient support.

Myth #4: Providing Support Means Lessening Rigor

Rugged individualism characterizes the fourth myth. There are those who believe that if students are provided and accept support, it is a sign of weakness. We've found that providing support is an essential component of a rigorous school. Students are motivated to do well when they value what they are doing and when they believe they have a chance for success. When Howard and Ron talked with teachers and parents about their own *positive* rigorous experiences, they invariably shared the support that they were provided.

RIGOR IS MORE THAN IMPLEMENTING THE SYLLABUS

We cannot assume that simply adopting the standards (US) [syllabus (NSW] provides a rigorous environment for students. Rigor is more than what you teach. It's how you teach and how students show you they understand. The Common Core (and related state standards) provide an excellent foundation for increasing rigor in your classroom; however, there are other integral aspects of rigor to consider.

Let me repeat myself:

True rigor is creating an environment in which each student is expected to learn at high levels, each student is supported so he or she can learn at high levels, and each student demonstrates learning at high levels."

Notice the key aspects of this definition:

First, you are creating an environment that is conducive to growth.

Rigor is about achieving at a higher level, but that doesn't happen immediately. It's important to focus on progress, those small steps that together show student growth. Encouraging students not to give up, using language that shows students you know they can learn, and celebrating the positive will help you boost learning energy and create an environment to support rigor.

Next, focus on your high expectations.

The Common Core standards are reflective of higher expectations, but you have to reinforce that belief. How can we put high expectations into practice? By not allowing the word "can't",

both from students and ourselves. By continually reminding students you know they can. You have to believe so your students over time will believe. A friend of mine says sometimes you have to believe for your students until they believe they can be successful.

The third aspect of rigor is supporting students so they can learn at higher levels.

This will require a focus on scaffolding within a lesson. Focusing on prior knowledge, modelling the thinking process behind learning strategies, and providing support for gaps that occur between their current knowledge and the standards are all critical. Some students will need extra help outside of class time, and that will require a schoolwide plan to provide those opportunities.

Finally, each student should demonstrate learning.

There are two aspects of this. First, provide a variety of ways students can demonstrate understanding. It's fine to use questions that are similar to the final assessment, but also provide opportunities to play to students' strengths. Allow them to show you they know through technology, drawings, projects, etc.

Then, as you use formative assessment to check for understanding, incorporate strategies for each student to participate. Using whole group instruction and asking one student to answer does not accomplish this goal. Use think-pair-shares, clickers, dry erase boards (or the whiteboard app for the iPad), or thumbs-up thumbs-down strategies so you can see if each student is understanding each part of the lesson.

This may sound daunting, but you are already demonstrating high expectations, providing support for students, and asking them to show you they understand. Building on these, you'll create a climate that supports rigor.

Rigor in Instruction – Linda Gojak – President of the National Council of Teachers of Mathematics

The coaches and I began our work of exploring the notion of rigor with an online search of the word "rigor." The thesaurus led us to a list of synonyms, including "affliction," "inflexibility," "difficulty," "severity," "rigidity," "suffering," and "traditionalism"—none of which describe characteristics of rigorous mathematics instruction. No wonder the teachers were confused! However, two additional words included in the list—"thoroughness"and "tenacity"—provided avenues for some serious thought about what "rigor"implies. We generated the following chart, which led to an interesting discussion with the classroom teachers. There are certainly other characteristics that can be added to the list.

Learning experiences that involve rigor …	*Experiences that do not involve rigor …*
▪ challenge students	▪ are more "difficult," with no purpose (for example, adding 7ths and 15ths without a real context)
▪ require effort and tenacity by students	▪ require minimal effort
▪ focus on quality (rich tasks)	▪ focus on quantity (more pages to do)
▪ include entry points and extensions for all students	▪ are offered only to gifted students
▪ are not always tidy, and can have multiple paths to possible solutions	▪ are scripted, with a neat path to a solution

▪ provide connections among mathematical ideas	▪ do not connect to other mathematical ideas
▪ contain rich mathematics that is relevant to students	▪ contain routine procedures with little relevance
▪ develop strategic and flexible thinking	▪ follow a rote procedure
▪ encourage reasoning and sense making	▪ require memorization of rules and procedures without understanding
▪ expect students to be actively involved in their own learning	▪ often involve teachers doing the work while students watch

Rigor Involves Everyone

Rigor involves all partners in teaching and learning. Teachers must consider rigor in planning lessons, tasks, and assignments. Rigorous lessons build on and extend prior knowledge. They encourage productive struggling. Although the objective of a lesson should be clear in the teacher's mind, the lesson should not focus on one correct path to a solution or even one correct answer. A rigorous lesson embraces the messiness of a good mathematics task and the deep learning that it has the potential to achieve.

Students who are successful in a rigorous learning environment take responsibility for their learning. They learn to reflect on their thinking. They persist in solving a problem when the path to solution is not immediately obvious. They recognize when they are not on the correct path and need to switch directions during the solution process. Students must learn to ask productive questions rather than expecting to be shown how to proceed. (And, teachers must answer those questions with just enough information to move students forward while preserving the challenge of the task!

Rigorous teaching and learning require rigorous formative assessment throughout a unit so the teacher knows what the student has learned and can plan additional activities, or adjust them, to address student needs. Students also have a role in formative assessment—they must approach tasks with tenacity and ask clarifying questions when they are unsure how to proceed. All assessments must include opportunities for students to demonstrate the processes and practices in their approach to doing mathematics. Good formative assessment can be incorporated into daily instruction and prepare students for the summative assessments that take place at certain points throughout the unit of study.

Moving toward Rigor

When selecting tasks, teachers must be sure that mathematical ideas are explicit and the connections are clear. The days of a few word problems at the end of multiple skill exercises in the textbook are over! Concepts must be introduced and explored in contexts that are interesting and motivating for students. Tasks must provide entry points for all students, offer them well-defined opportunities to make connections to other mathematics, and include both opportunities and expectations for them to develop deeper understanding. The focus and coherence of the Common Core State Standards lead the way to rigorous instruction. It is time for us to begin the journey.

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