



Kentucky Department of
E D U C A T I O N

Kentucky Department of Education

Model Curriculum Framework

Section IV:
Evidence-Based Instructional
Practices (EBIPs)

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Introduction to the Model Curriculum Framework

The **Model Curriculum Framework**, per [KRS 158.6451](#), provides guidance for schools and districts in implementing educational best practices in a way that creates curricular coherence to positively impact student success. Curricular coherence involves local alignment of standards, curriculum, instructional resources and practices, assessment, and professional learning within and across grade-levels in a district or school to help students meet grade-level expectations. According to research, schools that demonstrate increased curricular coherence also show marked improvements in student outcomes (Newmann, Smith, Allensworth, & Bryk, 2001). Figure 1.1 highlights the five key components of curricular coherence addressed within this document:

- **Section 1: Curriculum Development Process** – Outlines a systemwide process for articulating an instructional vision, developing a local curriculum aligned to the *Kentucky Academic Standards (KAS)* and selecting a primary high-quality instructional resource (HQIR) to support implementation.
- **Section 2: Professional Learning Communities** – Emphasizes a systems-based approach to developing a shared understanding of the PLC process as an aspect of continuous improvement, the role of leadership in creating a supportive culture and the role of teachers as effective collaborators within a PLC.
- **Section 3: Balanced System of Assessment** - Provides guidance on how teachers and leaders can implement a comprehensive, balanced system of assessments to ensure high-quality and reliable assessment practices with a focus on the formative assessment process and providing stakeholders with effective strategies for noticing, recognizing and responding to evidence of student learning.
- **Section 4: Evidence-Based Instructional Practices** - Supports leaders and teachers in understanding what constitutes an evidence-based practice, in coordinating a system of effective instruction aligned to disciplinary practices and outcomes of the *KAS* and in evaluating the quality of instructional resources.



Figure 1.1. Key Components of Curricular Coherence



The organization of this document mirrors the use of backward design, beginning with what educators must know and be able to do, proceeding to how learning will be assessed and concluding with how that translates into daily teaching and learning.

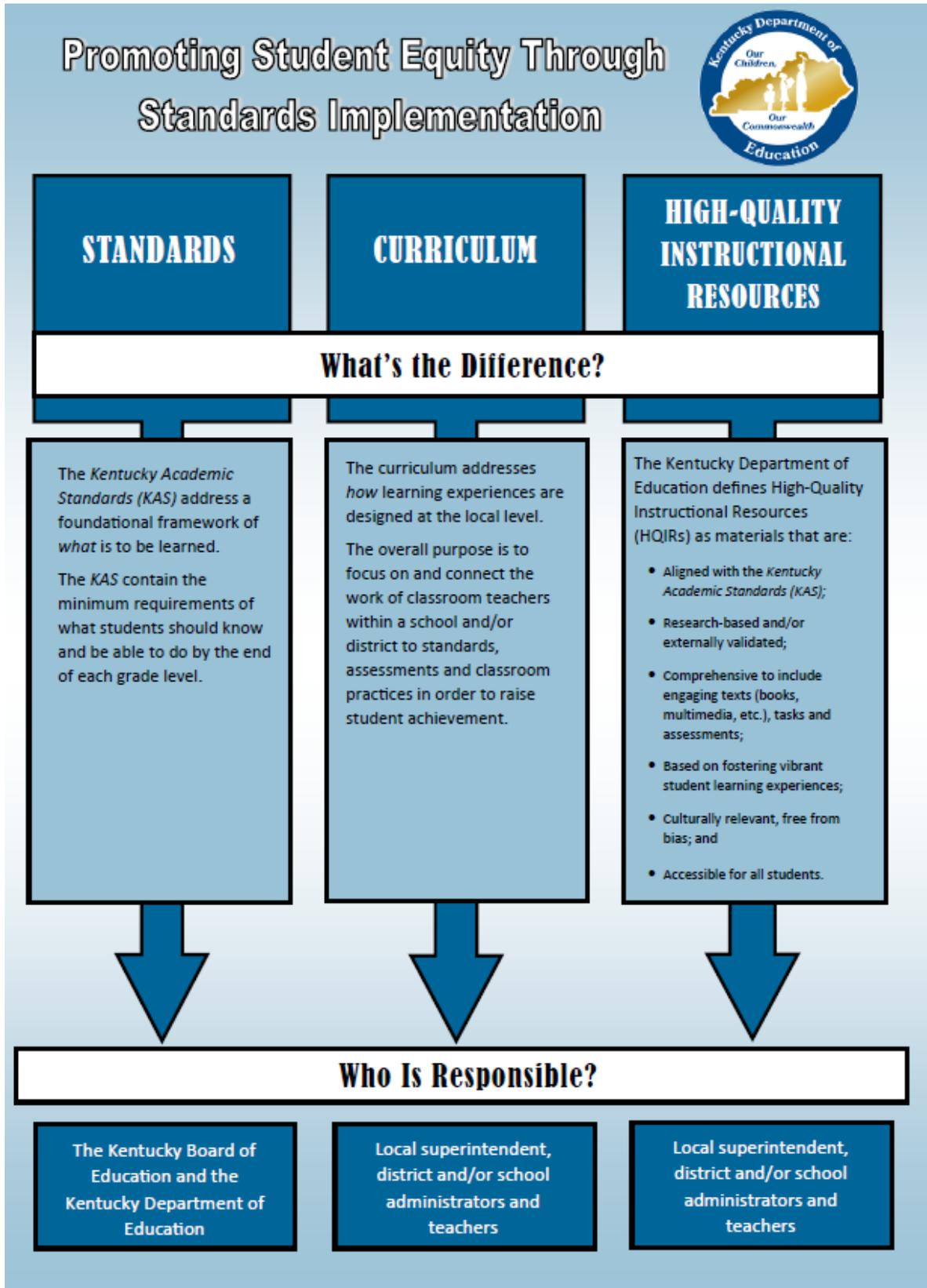
The five components of curricular coherence are essential to providing equitable access to learning for all students. Within U.S. schools, large racial and socioeconomic gaps still exist among graduation rates, test scores and advanced proficiency. Historically marginalized populations, such as students of color, English language learners and exceptional students, are less likely to be given access to high-quality curriculum and resources. A 2018 study, from districts around the country, found students of color and those from low-income backgrounds are less likely than white and higher-income students to have access to quality curriculum, instruction and grade-appropriate assignments (TNTP, 2018).

For educators to meet the challenge of helping **all** students reach grade-level expectations, they must have a clear vision of best practices in teaching and learning and a clear roadmap to follow throughout the year (Ainsworth, 2010). High-quality curriculum and instructional resources have the power to provide that roadmap by connecting standards, curriculum, effective instruction, assessment and professional learning (Achieve the Core, 2017).

To create curricular coherence, educators must understand the relationship between standards, curriculum and instructional resources. Figure 1.2 below highlights the differences between these terms as well as who has responsibility for each as defined in Kentucky law ([KRS 160.345](#), [704 KAR 3:455](#)).



Figure 1.2. Defining Standards, Curriculum and Instructional Resources



For schools and districts, translating standards into a guaranteed, viable curriculum is vital to student success and the first step in creating curricular coherence.

- **Guaranteed Curriculum** – Guaranteed ensures specific content is taught in specific courses and at specific grade levels, regardless of the teacher assigned to a student. When schools and districts are unable to guarantee the curriculum being taught, the result is redundancy and inconsistency from one classroom to the next across grade levels and little alignment between the standards, assessment and instruction (Dufour & Marzano, 2011).
- **Viable Curriculum** - Viability means the articulated grade-level standards, instructional calendar (pacing guide), and daily instruction are all manageable and can be realistically taught to mastery levels in the instructional year (Marzano, 2003). This means schools and districts must ensure enough instructional time is available to develop essential knowledge, skills and concepts of the guaranteed curriculum.

Development of a district curriculum aligned to the *KAS* and adoption of a primary HQIR does not guarantee students have access to the same knowledge and skills. A distinction must be made between the *intended* curriculum and the *implemented* curriculum. In many places, gaps exist between the district- or school-established curriculum and what is implemented by teachers in classrooms. For districts to truly achieve a guaranteed and viable curriculum, the leaders and teachers accountable for delivering it must possess a common understanding of the curriculum and of the HQIR.

To support effective implementation, teachers and leaders need ongoing professional learning experiences that deepen their knowledge of how the curriculum and HQIR work together to set a strong instructional foundation (Instruction Partners, 2019). The professional learning can occur through the PLC process, workshops, coaching, classroom observations, feedback and other job-embedded contexts.

Referencing Figure 1.1, when districts across Kentucky create coherence by implementing high-quality, standards-aligned curriculum and instructional resources, support implementation and continuous improvement through high-quality professional learning and collaboration, measure student growth through a balanced system of assessment and provide teachers and students access to evidence-based instructional practices, a more equitable environment is established. Leaders and educators working together to implement the local curriculum help ensure every student has access to the same content, knowledge and skills regardless of teacher or school they attend.



Evidenced-Based Instructional Practices

General Introduction

Providing equitable learning environments to all students starts with a locally developed guaranteed, viable curriculum that is aligned to the *Kentucky Academic Standards (KAS)*. Teachers then work collaboratively through the Professional Learning Communities (PLCs) process as they break down the standards and use their local curriculum to ensure all students are taught the same content, concepts and/or skills regardless of the teacher they are assigned. Collaborative teams create common assessments aligned to each unit’s intended learning outcomes, so all students are held to the same grade level expectations. Each teacher then implements the standards-aligned curriculum as they design and deliver classroom instruction to help students reach the learning expectations.

The actual classroom instruction students receive is the critical point in which “the rubber meets the road.” All of the work to create a written guaranteed and viable curriculum, to break down the standards and create aligned assessments is necessary, but the quality of the day-to-day classroom instruction students receive has a significant impact on their overall achievement. Research consistently indicates the importance of students having access to quality, standards-aligned, grade-level instruction (TNTP, 2018; Hattie, et al., 2021; Marzano, 2003). As teachers implement the curriculum, it is important that they strategically and intentionally utilize evidence-based instructional practices that support students in reaching the intended learning outcomes.

In their book, *Visible Learning for Literacy*, the authors state that “every student deserves a great teacher, not by chance, but by design” (Fisher, Frey & Hattie, 2016). This requires developing an understanding of the impact that instructional practices have on student learning. Teachers need to understand which practices, strategies and instructional routines work best in different teaching situations for students to reach those expectations. So, how do teachers know which instructional practices have the most potential to improve student learning? How can research on evidence-based practices support teachers in making these decisions?

This introduction takes a closer look at what is meant by evidence-based instructional practices, as well as the importance of effective implementation, intentional planning and gathering evidence to determine the impact on student learning. Following the introduction, this series will examine six evidence-based instructional practices teachers can use to support learners in reaching the expectations within the *Kentucky Academic Standards* and the local curriculum.



What are Evidence-Based Instructional Practices?

In December 2015, the United States Congress reauthorized the Elementary and Secondary Education Act through a law known as the Every Student Succeeds Act (ESSA). One requirement under ESSA is that school improvement efforts be rooted in "evidence-based activities, strategies, or interventions." While the term evidence-based has been in other areas of the law for many years, ESSA is the first federal law to define and identify levels of evidence for educational purposes. It defines evidence-based interventions as practices or programs that have evidence, usually through formal studies and research, to show they are effective at producing results and improving student outcomes when implemented.

For a number of years, the field of education has been making great efforts to implement evidence-based practices to improve the quality of instruction students receive and the outcomes they achieve. When teachers effectively implement evidence-based practices into classroom instruction, it can result in the following benefits for teachers and students (IRIS Center, 2014):

- An increased likelihood of positive student outcomes;
- Increased accountability because there are data to support the selection of a practice, which in turn facilitates support from administrators, parents and others;
- Less wasted time and fewer wasted resources because educators start off with an effective practice;
- An increased likelihood of being responsive to learners' needs; and
- A greater likelihood of convincing students to engage and try it because there is evidence that it works.

Educational research has provided considerable insight into what works when it comes to teaching and learning. According to Gazith (2021), the field of education is living through somewhat of a renaissance. "The work of researchers such as Robert Marzano, John Hattie, and David Sousa, has brought educational research to the educator in a form that is clear and implementable" (p. 4). Additionally, research from the field of neuroscience provides substantial knowledge about the brain and how students learn. Teachers can apply this research as practical strategies within their classrooms to create the environment necessary for learning to occur.

However, a gap exists between the research around evidence-based practices and the instructional practices teachers choose to use. Often, educators use practices and strategies they have seen others use, including their own teachers, without questioning whether those practices are supported by research. In fact, research has indicated that some of those practices are ineffective or have no data to support their use (IRIS Center, 2014).



So, how do educators sort through the evidence to make informed decisions that truly impact student learning? According to Hattie (2012), instead of asking “What works?” educators need to focus on the more important question of “What works best?” When analyzing the research, which practices, when effectively implemented, can result in more than one year’s growth in one year’s time to accelerate student learning?

One idea that is clear from the research is that educators, first and foremost, must begin with the belief that all students can succeed. Gazith (2021) cautions that “if the adult in the students’ life, the person who is supposed to be the expert scaffolder doesn’t believe, neither will they. Students need their educators to believe, often despite all odds and at all costs, that they will exceed the expectations that everyone holds of them” (p. 4). In essence, teachers get out of the students what they expect, and the teachers’ expectations of their students become the reality for those students. Teachers should have expectations that appropriately stretch students but are still within reach for the students (Fisher, et al., 2016).

According to Hattie (2012), the differences between high-effect and low-effect teachers are related to their attitudes and expectations as they make key decisions regarding what to teach and at what level of difficulty, as well as their understanding of learning progressions and the impact of their teaching. “It is some teachers doing some things with a certain attitude or belief system that truly makes the difference” (p. 26). Fisher, et al. (2016), states that at a minimum, quality Tier 1 instruction should include (p. 147):

- Teacher clarity on, and communication about, the learning intentions and success criteria;
- Student ownership of the expectations for learning;
- Positive, humane, growth-producing teacher-student relationships;
- Modeling and direct instruction of content;
- Collaborative learning opportunities on a daily basis;
- Small group learning based on instructional needs rather than perceived ability; and
- Spaced (rather than mass) independent practice and application of content.

Moving from Research to Classroom Implementation

It is important to note that no single instructional practice or strategy can guarantee that all students will learn for several reasons, including (Marzano, 2017; p. 1):

- Many factors other than the use of instructional practices affect student learning;
- Instructional practices work in concert or sets and should not be thought of as independent interventions; and
- Educators have to use the practices in specific ways to produce positive results.



This is why teaching is both an art and a science. As teachers gain more skill with evidence-based instructional practices, the better the teacher will be able to design and implement lessons that improve student learning (Marzano, 2017). However, even when educators identify evidence-based practices, there is a lot of variation in the effectiveness of these practices. In the book, *Great Teaching by Design* (2021), the authors argue that this variation reflects the different interpretations teachers make when implementing the practices at the classroom level. While choosing an evidence-based practice is the first step, the quality of implementation is critically important.

Simply having knowledge about best practices in teaching and learning does not always mean that people are able to use that knowledge to generate ideas and then transfer those ideas into classroom instruction. Each day, teachers make decisions that have the potential to positively impact student learning. That potential needs to be consistently and reliably transformed into effective implementation. Hattie, et al. (2021), recommends expanding the question of “What works best” to “How do we implement what works best?” They argue that to truly improve student learning outcomes, educators must use their knowledge about what works best in teaching, ensure effective implementation and then monitor the impact of the instruction. Goodman, et al. (2020), found that when teachers and entire school teams became increasingly intentional with evidence-based teaching practices, thinking about why they were using them and how to consistently implement the practices, student engagement and learning increased significantly.

To ensure that learning occurs, it is important that educators implement practices at the right time, with the right content, in the right way. Activating prior knowledge, classroom discourse, higher-order questioning and effective feedback all have the potential to impact student learning above and beyond one year’s growth in one year’s time. However, successful implementation of these strategies determines whether or not that potential is realized through the impact on student learning (Hattie, et al., 2021).

When it comes to utilizing evidence-based practices, it is imperative that educators work to close the gap between potential, intention and implementation. As stated by Hattie, et al. (2021), “Great teaching can be designed, and when it’s designed well, students learn more” (p. 9). They suggest when making decisions about teaching and learning, consideration should be given to the following four critical components of evaluative thinking (p. 8):

- Discovering where learners are in their learning journey and where they need to go next in that journey. Where students are in their learning journey represents their learning potential and our teaching potential.
- Planning, designing and implementing learning experiences based on the specific context of the teacher’s classroom and learners. This planning must focus on the



intentional selection of strategies, approaches and interventions to teaching and learning.

- Using evidence-based approaches to teaching and learning that support learners as they move forward in their learning journey. Not only do educators need to identify these evidence-based approaches, but also they must implement them into their teaching.
- Evaluating the impact of these learning experiences and making decisions based on that impact.

Importance of Intentional Planning

An important step in closing the gap between research and effective classroom implementation is intentional planning on the part of the teacher. In order for educators to gain maximum benefit from evidence-based practices, they must be mindful of and purposeful in their planning every time they enter the classroom. According to Gazith (2021), teachers should consistently ask themselves questions, such as (p. 6):

- How is the student's behavior a sign of unmet need(s)? How can I respond to students' needs so that they don't misbehave to have their needs met?
- What is my goal for my students in today's lesson? What do I want my students to be able to do by the end of the lesson?
- What is the most effective way to teach them so that they learn?
- What is the purpose of this information? How do I share this purpose with my students so that learning is meaningful for them?
- How do I leave my voice behind for my students so that they can use that voice to guide them so that they will eventually become successful, independent learners?

Intentional planning begins with having the end in mind. Teachers should know from the outset of the unit or lesson what they expect students to learn and how they will assess or measure that learning (Fisher & Frey, 2015; McTighe & Wilis, 2019). This provides a blueprint that guides teachers' construction of the curriculum, the aligned assessments and the necessary learning experiences for students to reach the final destination. Backward design encourages teachers to think like an evaluator before planning the learning experiences to strengthen alignment between assessment and classroom instruction (McTighe & Willis, 2019).

It is important to remember that learning is a process, not an event. There are three stages in the learning process that moves students from a novice new to the learning goals to an expert who can apply the goals in multiple, authentic contexts. The stages include (1) **surface learning**, (2) **deep learning** and (3) **transfer**. All three stages are important components and necessary for teaching and learning to be effective. Table 5.1 provides a description of each stage in the



learning process and examples of possible evidence-based practices that can support learners in each phase (Hattie, et al., 2017; Fisher, et al., 2016).

Table 5.1. Stages of Learning

Stage of Learning	Description	Possible practices to support learners
Surface Learning	<ul style="list-style-type: none"> • Occurs when students are exposed to new concepts, skills and strategies • Does not mean superficial learning • Provides a foundation on which to build as students are asked to think more deeply 	<ul style="list-style-type: none"> • Activating and leveraging prior knowledge • Explicit instruction • Note-taking • Summarizing • Mnemonics
Deep Learning	<ul style="list-style-type: none"> • Occurs when students consolidate their understanding as they apply and extend some surface learning knowledge to support deeper conceptual understanding • Will often take up more instructional time and can only be accomplished when students have the requisite knowledge to go deeper • Must be supplemented by scaffolding to ensure the different needs of students are being met 	<ul style="list-style-type: none"> • Concept-mapping • Classroom discussion • Questioning • Collaborative learning • Metacognitive strategies • Receiving effective feedback
Transfer	<ul style="list-style-type: none"> • Occurs when students take their consolidated knowledge and skills and apply them to new scenarios and different contexts • Also a time when students are able to think metacognitively, reflecting on their own learning and understanding 	<ul style="list-style-type: none"> • Collaborative learning • Questioning • Extended writing • Discerning similarities and differences

When planning a lesson, series of lessons or a unit, the practices teachers use and when they use them are equally important when it comes to instruction having an impact on learning. It is not a matter of all surface or all deep; it is a matter of being clear when surface and when deep is truly required as students progress toward the intended learning outcomes (Fisher, et al., 2016). Practices that facilitate students' surface-level learning do not necessarily work equally well for deep learning, and vice versa. Matching the right approach with the appropriate phase of learning is critical to support students' understanding of the content (Hattie, et al., 2017).



The gradual release of responsibility (GRR) framework can support students as they progress through the three phases of learning. This framework purposefully shifts the cognitive load from teacher-as-model to joint responsibility of teacher and learner, to independent practice and application by the learner. The four main components of gradual release, as shown in Figure 5.1, include (1) **focused instruction**, (2) **guided instruction**, (3) **collaborative learning** and (4) **independent learning**. Table 5.2 provides an overview of the major characteristics of each component (Fisher & Frey, 2014).

Figure 5.1. *Gradual Release of Responsibility Framework*

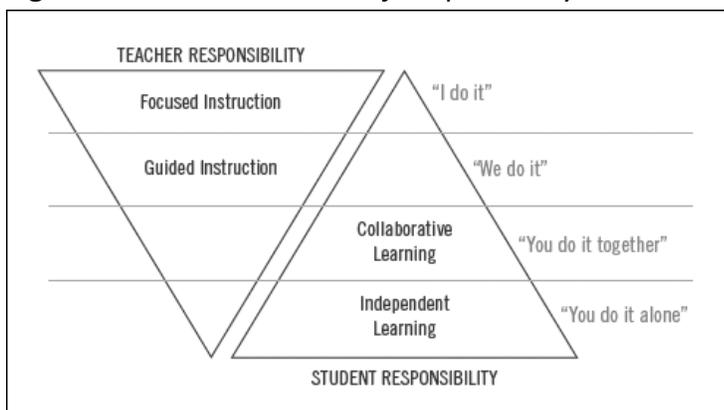


Table 5.2. *Components of Gradual Release of Responsibility (GRR) Framework*

GRR Component	Characteristics
<p>Focused Instruction</p>	<ul style="list-style-type: none"> • Teacher establishes the purpose based on the standards and communicates the purpose to students through learning goals and success criteria. • Teacher models thinking, demonstrates skills and notices student thinking in relation to the intended learning outcomes. • This is also a time for direct or explicit instruction.
<p>Guided Instruction</p>	<ul style="list-style-type: none"> • Point where the cognitive load begins to shift to the students. • Teacher focuses on scaffolding students' developing skill or knowledge through questioning, prompting and cueing. • Most effective with small groups that are formed based on instructional needs, and groupings change frequently due to ongoing formative assessment. • Ideal time to differentiate.



<p>Collaborative Learning</p>	<ul style="list-style-type: none"> • Students work together and use academic language to consolidate and apply their understanding of the content. • Students are primarily responsible for their learning while teacher observes and provides support when needed. • Tasks should ensure both individual and group accountability. • Teacher observes, confers with students, gathers formative data to inform instruction and provides students with feedback on their learning.
<p>Independent Learning</p>	<ul style="list-style-type: none"> • Students are engaged in tasks that require them to apply what they have learned on their own. • Students use feedback from teachers, peers and themselves to make decisions regarding time and resource allocation and to help resolve problems when they are stuck. • Focuses on building students’ metacognitive and self-regulation skills. • Teacher notices ongoing performance and provides feedback that helps students identify the gap between their current state and the intended learning outcomes.

According to Fisher and Frey (2014), all four components of the gradual release model are important and necessary for deep learning to occur, for students to think critically and creatively and be able to transfer their learning to new situations. The GRR Framework is recursive and not meant to be linear. Teachers “must plan to intentionally vary the instructional arrangements to promote interaction with the teacher, with the content, and of students with one another” (Fisher & Frey, 2015; p. 6). Based on the learning outcomes of a lesson or series of lessons, teachers may choose to begin with any component of the framework. Students move back and forth between each of the components as they progress toward the learning expectations.

Determining Impact

Teachers need to use evidence-based practices to ensure that students learn, but Frey, et al. (2018), argue that too much of the conversation is focused on what teachers are doing rather than on the learning of the student. Teaching must always be considered in terms of its impact on student learning. Teachers need to view student learning as feedback about the effectiveness of their instruction, and they should never hold an instructional practice in higher esteem than their students’ learning. After teachers implement *what works best*, they must



gather evidence to know with confidence that their *implementation of what works best* resulted in student learning (Fisher, et al., 2021).

The only way to determine if students have learned what has been taught and to determine the effectiveness of the instructional practices is through assessment. Assessments can be formal or informal and summative or formative. Assessing learning requires collecting evidence of student learning throughout each lesson and then acting on that evidence. Teachers need to know which instructional practices are working or not working, and they need to be prepared to adapt their instruction to each student's situation, context and prior learning (Hattie, 2012). Fisher and Frey (2015) state that "acting on the data they collect is a sign of strength, not weakness, in teaching. High-performance learning environments are data driven and student centered" (p. 11).

As a part of the formative assessment process, individual teachers gather evidence minute-by-minute and day-by-day to determine what is working and to adjust instruction based on student needs. In addition, teachers need to meet to discuss and evaluate their teaching in light of the evidence gathered through the use of common formative assessments making the effect of their teaching visible to themselves and to their colleagues (Hattie, 2012). These types of conversations are part of the ongoing work of a professional learning community (PLC) and help to develop both the individual and collective capacity of its members. Through these collaborative conversations, the team focuses on addressing questions such as:

- What instructional practices worked well?
- How were the practices implemented in each classroom? What changes need to be made to improve the implementation of these practices?
- What instructional strategy or practice failed to produce results for the whole group as well the subgroups? What might be possible reasons for these results?
- Based on the evidence, what are some areas of professional learning that could support the team in effectively identifying and implementing instructional practices to improve student learning?

According to Fisher, et al. (2021) to create truly equitable learning environments, every teacher must maximize his or her impact on every student in the school, and educators must focus on making a difference together. "The greatest impact on student learning comes from leveraging individual efficacy, or expectations of success, into a collective whole" (p. 28). This requires that educators across a school or district have a shared language of teaching and learning that includes understanding of instructional practices that have the greatest potential to impact student outcomes and the decision-making process of when to use those strategies. Then, educators need to channel that knowledge into a shared language for effective implementation.



Evidenced-Based Practice # 1: Establishing the Learning Environment

Introduction

While having access to a guaranteed and viable curriculum supported by evidenced-based instructional practices and high-quality instructional resources is a critical part of providing equitable learning environments for all students, educators also must create a classroom culture that supports students in meeting the intended learning outcomes. According to Ritchhart (2015), the classroom culture is foundational to student success and determines how the curriculum comes to life. Maintaining a classroom culture conducive to learning is key to a teacher’s instructional efforts and to the ultimate success of the students. Even if a teacher uses evidence-based practices with instruction and assessment but does not attend to the classroom culture, the teacher and students will likely fail despite those practices. Conversely, a teacher who works to create a safe and supportive culture and intentionally aligns instructional efforts to those shared beliefs is more likely to experience significant changes in student outcomes (Erkens, Schimmer & Vagle, 2018).

Culture is a collection of a group’s commonly shared attitudes, beliefs, values, goals, behaviors, rituals and social norms. Teachers are the primary drivers of classroom culture. The way in which teachers design and deliver instruction and how they respond during instruction conveys what they most value. “*Who* teachers are teaching matters more than *what* they are teaching, since teachers can’t authentically get to the *what* until they attend to the *who*” (Erkens, et al., 2018; p. 13).

Students want their teachers to care, to be treated fairly and to know what to expect each day they arrive in the classroom. Fisher and Frey (2015) state, “The qualities of interactions between students, as well as the students and their teachers, can mark the difference between learners who feel valued and involved and those who are marginalized and therefore find ways to distance themselves from the environment” (p. 131). Teachers need to focus on purposefully creating a classroom culture where learners see each other as resources, rather than competitors. The classroom should be a place where learners are provided the opportunity to achieve more as part of the collective whole than they could individually. It should become a place where students want to linger and be (Hoffer, 2020). When students are a part of a safe and supportive environment, they are more likely to (Grit & Major, 2018; Hoffer, 2020; McTighe & Willis, 2019):

- Be self-confident;
- Be themselves;
- Be willing and able to exchange ideas;
- Participate even when mistakes are possible;



- Collaborate successfully with peers;
- Ask questions of the teacher and other students;
- Contribute to discussions without fear of ridicule or personal judgement;
- Receive feedback that supports the growth of the work or learning;
- Provide feedback to others to support the growth of the work or learning;
- Reflect and assess their own work as well as contribute to the assessment of others' work;
- Persist in work that is appropriately challenging; and
- Set personal goals in relation to the work.

Why is it so important to create safe and supportive classroom cultures? What insights can educators gain from the fields of neuroscience and psychology regarding the brain and the type of environments that are conducive to learning? How do teachers apply that understanding to create these types of spaces for all students? This section will focus on (1) **current brain research and the role of emotions in learning**, (2) **the importance of fostering strong teacher-student relationships**, (3) **creating the physical and social environment to support learning** and (4) **improving student motivation**.

Brain Research and the Role of Emotions in Learning

Research from the field of neuroscience has shown that cognition and emotions do not operate independently but are intricately linked. For learning to occur, educators must not only focus on students' academic learning, but also on the social and emotional factors that affect student learning (McTighe & Willis, 2019). Research also shows that all children have the ability to learn, but how they do so is highly individualistic and influenced by their immediate experiences, relationships and environment. Learning environments matter for all students, but especially for those students from poverty and those who face other challenges outside the classroom (Rimm-Kaufman & Jodl, 2020). In the book, *Culturally Responsive Teaching and the Brain*, Hammond (2015) states:

“The brain’s two primary directives are to stay safe and happy. The brain takes its social needs very seriously and is fierce in protecting an individual’s sense of well-being, self-determination and self-worth, along with its connection to community. We cannot downplay students’ need to feel safe and valued in the classroom. The brain will not seek to connect with others if it perceives them to be threatening to its social or psychological well-being based on what they say and do” (p. 46).

So, how do teachers create an environment that allows the brain to feel safe and happy? To answer that question, it is critical to understand the role of certain structures in the brain and how those structures can hinder or support learning. The brain’s sensory register constantly



pays attention to external stimuli from the environment but also internal stimuli already present in one's emotions, experiences and stream of consciousness. In order for learning to occur, "new learning must first cut through the clutter of students' sensory registers and the constant churn of internal emotions, ideas, and thoughts they bring to the classroom" (Goodwin, Gibson, and Rouleau, 2020; p. 20).

Ultimately, to acquire new learning, to consolidate that learning and make connections to existing knowledge, the information must make its way to the prefrontal cortex, which is the site of executive function and is the main command center of the brain. The prefrontal cortex oversees thinking, manages working memory and is responsible for planning, abstract thinking, organization, and self-regulation, as well as housing imagination. This part of the brain has almost an endless capacity to learn and rewire itself and is the area where students have the chance to build their brain power. However, in order for that to occur, stimuli must make it past the lower brain's primary gatekeepers, one of which is the amygdala (Hammond, 2015).

Located in the temporal lobe, the amygdala is the brain's emotional filter. According to Hardiman (2012), the amygdala "is engaged in both implicit emotional reaction, such as an unexpected fearful event, and in explicit emotional learning, such as learning about a danger and remembering the information" (p. 35) It also engages another structure called the hippocampus, which plays a key role in memory. The connection between these two structures explains why someone can more easily remember emotionally-charged events better than mundane daily occurrences.

The amygdala is designed to act in less than a second in response to any hint of a social or physical threat and can override the prefrontal cortex. When this occurs, it triggers the release of cortisol, the body's main stress hormone. This is known as an "amygdala hijack," and once cortisol is released, it inhibits all other cognitive functions, such as learning, problem-solving and creative thinking (Hammond, 2015). ***When someone is in a state of stress, whether actual or perceived, new information will not move through the amygdala's filter and into the prefrontal cortex.*** Instead, the input goes to the lower, reactive brain, which has a limited set of behavioral responses that include "fight, flight or freeze" and is focused purely on survival. When learners are anxious, sad, frustrated, bored, hurt or angry, these survival behaviors can take over and undermine the most carefully designed lessons (McTighe & Willis, 2019).

Sadly, many students come to school already in a heightened emotional state. McConchie and Jenson (2020) report that healthy emotions appear to be less and less common in schools today. Many students are suffering from chronic stress whether from social media, fewer intact families, immigration-status questions, discrimination or other factors. In the school setting, this stress may be due to a lack of peer acceptance, bullying or repeated failures with a task or



subject. In addition, students often lack the self-regulation skills to help them process and manage emotions caused by these stressors.

Chronic stress results in increased levels of cortisol and leaves a person in a constant state of high alert. It can affect both short- and long-term memory. Someone who is stressed is not able to generalize or adapt old pieces of information to new scenarios as well as non-stressed individuals. It impacts an individual's ability to concentrate, to recall declarative information and hinders executive function (Medina, 2014).

A key action educators must take to improve student outcomes is to ***create a safe and supportive environment that helps calm the amygdala and opens the neural pathways to the hippocampus and the prefrontal cortex***. Teachers need to create a classroom environment that seeks to neutralize negative emotions and elicits positive emotions that enhance memory, cognition and creativity. Rimm-Kaufman & Jodl (2020) state that “when educators construct learning environments with the understanding that childrens’ cognitive, emotional, and social domains are integrated and mutually reinforcing, children are better equipped to learn and make greater academic progress” (p.32).

Classrooms that are emotionally safe, prioritize relationships, and are cognitively stimulating contribute to brain development and help offset stress and trauma. ***Even in the presence of negative stressors outside the classroom, neuroscience points to the brain’s malleability and the potential for growth, change, and resilience if children experience enriched environments where they are exposed to rich language and learning materials, feel safe, have a sense of belonging, and experience healthy relationships with their teacher and their peers*** (Rimm-Kaufman & Jodl, 2020).

Fostering Teacher-Student Relationships

A critical component of creating safe and supportive learning environments is for teachers to develop meaningful relationships with their students. The brain is wired to scan continuously for social and physical threats, except when in positive relationships. When people experience positive relationships, it triggers the release of chemicals in the brain that help to keep the amygdala calm so the prefrontal cortex can focus on cognition and learning. Hammond (2015) argues that “too often we ignore the quality of our interactions with students and instead focus primarily on the curriculum. In culturally responsive teaching, relationships are as important as the curriculum. It is the key ingredient in helping culturally and linguistically diverse students authentically engage” (p. 72).

Trust is at the core of positive relationships and showing genuine care for students helps to generate that trust. This involves not only caring for them in a general sense, but also in a social and emotional sense. Students need to know that teachers authentically care about who they



are, what they have to say and how they feel. According to Marzano (2011), “positive relationships between teachers and students are among the most commonly cited variables associated with effective instruction. If the relationship is strong, instructional strategies seem to be more effective” (p. 82).

All students feel a fundamental need to belong, feel competent and to feel in control. Some students are dealing with difficult situations in their own lives that have wired their brains for stress and often do not have any positive relationships to help offset it. Sprenger (2020) reminds educators that these students “are not there to *give us* a hard time; rather, *they are having* a hard time” (p. 37). When educators take time to build relationships that support students in meeting these needs, it complements the overarching goal of education: to engage students and support their learning and achievement (Hattie & Anderman, 2020).

Teachers should not confuse positive teacher-student relationships with friendships. While it is important that students also experience positive peer relationships, educators are not their peers. Teachers should be viewed by their students as a “warm demander.” A “warm demander” communicates personal warmth and positive regard toward students while at the same time demands they work toward high standards. These teachers provide concrete guidance and support for meeting the learning expectations, specific corrective feedback, and opportunities for processing information and culturally relevant meaning making (Hammond, 2015). The following list provides six actions teachers can utilize to foster positive teacher-student relationships in their classrooms (Fisher, Frey & Smith, 2020; Sprenger, 2020).

- **Know students' names and how to pronounce them.** Students often report that their teachers do not know their names. For a teacher to know their students, it is important to know how to say their names. Pronouncing students' names correctly conveys important messages to the students, including that the teacher cares about each student, accepts each student and that each student is important.
- **Say hello and good-bye to every student every day.** Looking at each student and greeting him or her conveys that the student is valuable and worth the teacher's time. A study conducted by Cook, Fiat and Larson (2018) showed that greeting and welcoming students each morning increased achievement by 20 percent and lowered disruptive behavior by 9 percent. Through the ritual of greeting, adults model caring and demonstrate the importance of this social-emotional learning skill (SEL) to students. Students also can exercise the SEL skills of using words to identify their feelings as teachers greet them and give students a chance to ask for support. For example, teachers might say, “Let me know if there is something you need for today's project” or “You look upset. Are you OK?” In doing so, the teacher is helping to prime the students for academic focus through eliciting positive emotions before the class even begins (Benson, 2021).



- **Know their interests and attend extracurricular activities:** Part of creating a positive classroom environment that propels learning is getting to know students' interests and demonstrating care and support by attending extracurricular activities. Teachers also should plan instruction with students' interests in mind. Psychology and neuroscience both indicate that linking learning with students' interest is not a luxury, but a necessity. In addition, teachers need to help students make interest-based connections with the big ideas and key concepts they are learning (Tomlinson & Sousa, 2020).
- **Speak with respect:** Words are powerful, and harsh or sarcastic words from a teacher can damage relationships and prevent students from trusting the adult who is there to teach them.
- **Monitor nonverbal communication:** More than half of all communication is nonverbal and students pay attention to the adult's body language. Eye rolls, crossed arms and defensive stances send powerful negative messages to students about the approachability of the teacher and whether this teacher is trustworthy.
- **Share your world:** Students want to know more about their teachers, and teachers should share aspects of their life that are appropriate for school. In doing so, students are provided insights into a teacher's humanity, and it helps them form stronger connections to the teacher.

Teacher-student relationships require effective communication and the time to address issues that strain the relationship. Teachers need to be consistent and fair and repair relationships that are damaged when problematic behavior occurs (Tomlinson & Sousa, 2020). Using restorative practices, the teacher provides students the opportunity to take responsibility for their behavior and to make amends. This can take the form of a simple impromptu conference, a class meeting or circle, or a more formal victim-offender dialogue. The point is to ensure that students understand that their actions caused harm and that they can repair that harm (Fisher, Frey & Hattie, 2016).

Establishing the Physical and Social Environment

In addition to prioritizing relationships, psychological safety in the classroom includes the extent to which students feel a sense of order and routine. When the expectations for acceptable behavior are unclear, classroom routines are lacking, resources are unorganized, or rules are inconsistently applied, students can become confused, distracted and unruly. Part of being an effective teacher is to be an effective classroom manager and establish clear expectations, procedures and routines at the beginning of the school year (Marzano, 2017; McTighe & Willis, 2019).

According to Hattie and Anderman (2020), classroom management acts as the gatekeeper of learning and includes the social, cultural, instructional and organizational contexts. It provides



the teacher and students with a positive framework for both interpersonal and academic interactions. Research shows that effective classroom management significantly increases student academic achievement and decreases problem behaviors.

As part of creating a safe and orderly environment, teachers need to consider how they will involve the students in the creation of the classroom rules and procedures. Doing so helps move students away from merely compliance and maximizes their sense of ownership. Teachers also need to consider how they will help students understand the rules and procedures, why they are important and how they support a safe and orderly learning environment. Fisher, Frey and Hattie (2021) recommend using the term agreements instead of rules because agreements represent the social contract of the classroom community, rather than a narrower set of behavioral guidelines that have been written solely by the teacher. Based on a review of the research, teachers should consider the following characteristics of effective class agreements (adapted from Alter & Haydon, 2017; Fisher, Frey & Hattie, 2021):

- **Number of agreements:** A fewer number, rather than more, works better. The recommendation is about 3-5.
- **Created Collaboratively with Students:** Research recommends soliciting and integrating student input when creating classroom agreements. Students are more likely to follow rules or agreements that they help create.
- **Stated Positively:** Use wording that describes the desired behavior rather than the undesired behavior. Avoid a list of agreements that begin with the word “No” or “Don’t” because these do not tell students what they should do, only what they should not.
- **Specific in nature:** The agreements should state explicitly what the expected behavior should be, which is key to increasing students’ ability to self-regulate.
- **Publicly posted:** Once completed, the agreements should be posted in a way that serves as a visual prompt for teaching and promoting prosocial behavior. Consider using pictures to represent words for younger students.
- **Taught to Students:** The agreements should be taught each day for the first week of school and then revisited as needed throughout the year, especially after long breaks. One possible approach for teaching the agreements is to state each agreement, give a rationale, provide examples and non-examples and allow the students opportunity to practice.

The agreements should convey high expectations, mutual respect and an acknowledgement of the learning community’s needs. They should emphasize a collaborative spirit, signal students that learning is social and done in the company of others. Additionally, the agreements should communicate to the students that the role of the teacher is to foster learning, not to merely control the students (Fisher, et al., 2021).



The physical layout and appearance of the classroom also can enhance or hinder students' perceptions of order. The learning environment should be free from clutter and visually pleasing. The classroom walls should display deliberate pieces of student work that reflect the learning outcomes of the current unit of instruction. This might include anchor charts co-created with the students, work that meets the success criteria within the unit, or models and/or exemplars of student work. Teachers should also consider making regular changes to the learning environment as an effective way to capture student attention and provide visual stimulation. Possible ideas include changing the seating arrangement, rotating visual displays, and using objects that connect to the current content they are learning (Hardiman, 2012).

When determining the physical arrangement of the furniture, teachers should do so in a way that allows for easy movement of students around the room. Research shows that exercise and movement positively impact cognition and learning. In order to properly function, the brain requires high levels of oxygen and glucose supplied by the blood. When the brain is well-nourished, it is better able to attend to, process, retain and recall new learning (Kagan, 2016). One way to meet this need is to provide students opportunities for movement within the classroom and during content instruction. Possible ideas include the use of rotating workstations, special nooks and alcoves for reading, and using instructional strategies that involve movement that allow students to work with classmates as they process and respond to content questions/tasks. In addition, teachers also can utilize energizers and brain breaks to help increase blood flow and nourishment to the brain and help foster a joyful, positive environment.

Improving Student Motivation

Student motivation plays a crucial role in improving student outcomes and academic achievement. Students need to believe that they can be successful with the tasks they are assigned, feel they have some autonomy and self-direction in their activities and believe their abilities can grow and improve over time. According to Hattie and Alderman (2020), "Of all motivation-related conditions that have been studied, those related to students' perceptions of their competence, expectancies for success, and sense of efficacy have proven to be particularly robust predictors of achievement" (p. 166).

Students' level of motivation initiates and directs their behavior. It explains their willingness and promptness in starting academic tasks, as well as the amount of effort they give. Motivation impacts their persistence, or lack thereof, with academic work when facing challenges and distractions (Hattie & Anderman, 2020). Two key areas that impact student motivation is their sense of self-efficacy and their mindset.



Student Self-Efficacy

Efficacy is defined as an individuals' judgements of their own skills for performing specific actions, solving particular types of problems or achieving a desired outcome (Hattie & Anderman, 2020). Self-efficacy affects the choices individuals make, the effort they put forth, their perseverance when facing obstacles and how quickly they recover after experiencing a failure or setback (Silver & Stafford, 2017). Table 5.3 compares the characteristics of students with high self-efficacy to those with low self-efficacy (Fisher, et al., 2016; Hattie, 2012; Silver & Stafford, 2017).

Table 5.3. *Characteristics of High Self-Efficacy vs Low Self-Efficacy*

Students with High Self-Efficacy	Students with Low Self-Efficacy
<ul style="list-style-type: none">• Take on and persist with challenging tasks• Expend more effort• Demonstrate greater academic performance• View hard tasks as challenges rather than try to avoid them• View failures as an opportunity to learn and to make a greater effort or to look for new information next time• Are more motivated to use specific learning strategies and to engage in self-directed learning	<ul style="list-style-type: none">• Are more resistant to engaging in learning• Shy away from difficult tasks they view as personal threats• Show little to no commitment to goals• When faced with challenging tasks, dwell on their personal deficiencies and obstacles they will encounter• Give up quickly when facing challenges• Are slow to recover their sense of confidence following failure or setbacks• Tend to point to external factors as the cause of their success or failure

A critical first step teachers can take is to build a student's sense of confidence that they can attain the learning goal and success criteria within each lesson. When students lack confidence, they often will not focus on what is being taught (Fisher, Frey, & Hattie, 2016). When students know and understand the expected outcomes of a lesson, it provides them with a sense of control in the learning process and guides where they need to focus their time, attention and effort. The following list provides suggestions for increasing students' self-efficacy (Fisher, et al., 2016; Mathisen & Bronnack, 2009; Silver & Stafford, 2017).

- Share learning goals and success criteria with students.
- Develop learning progressions—a roadmap towards the mastery of a skill or task—that clearly represents expectations at different stages of achievement. This can help students track their progress towards the mastery of a skill or content-area.
- Provide direct instruction with modeled examples.



- Provide guided use of techniques on well-defined problems and supervised use of techniques on self-generated problems.
- Use peer models for learners to observe others who are working through or have mastered a similar challenge and are modeling an effective strategy.
- Concentrate on improvement rather than a finite goal. Provide specific feedback on attempts made by learners that help them determine next steps for improvement.
- Demonstrate teacher credibility by being fair to all.
- Create high levels of trust between the teacher and the student and between students.
- Welcome errors as opportunities for learning.
- Help students learn the difference between hard work and strategic effort.
- Treat students' successes as though they are normal, not an isolated example or fluke.

Student Mindset

Not only does self-efficacy play a key role in students' motivation to learn, but it also impacts their mindset - the way in which they view intelligence and their ability to learn. Mindsets are defined as the set of assumptions and beliefs individuals have about their ability to learn and grow and is the driver of student motivation (Conyers & Wilson, 2020; Hattie & Anderman, 2020). Individuals with a growth mindset believe that intelligence is malleable and that they can grow and develop their intelligence and skills over time. Those with a fixed mindset believe that their intelligence, talents and skills are fixed and cannot change. The characteristics of individuals with a growth mindset versus a fixed mindset are summarized in table 5.4 (Dweck, 2016).

Table 5.4. *Growth vs. Fixed Mindset*

Context	Growth Mindset	Fixed Mindset
Challenges	Embraces challenges	Avoids challenges
Obstacles	Keeps going when the going gets tough	Gives up easily and becomes defensive
Effort	Views effort as essential for achieving mastery	Views effort as pointless
Criticism	Actively learns from negative but useful feedback	Ignores negative but useful feedback
Success of Others	Learns from and is inspired by the success of others	Feels threatened by the success of others



Fostering a growth mindset begins with developing students' understanding that the brain is malleable and can grow significantly in capacity over time. When learners understand and act on the belief that they can “build” brain capacity, they are more likely to persist in learning and less likely to be negatively impacted by setbacks along the way. (Tomlinson & Sousa, 2020). Research shows that if students are explicitly taught about brain plasticity (the ability of the brain to grow and change over time), their motivation to learn increases. Additionally, if teachers provide students with specific instruction on how to use effective learning strategies, research shows there is tremendous potential for students to make steady academic gains. As students begin to experience success and make gains, it helps them sustain their growth mindset over time (Conyers & Wilson, 2020).

Not only is it important for students to understand that the brain has the capacity to change during learning, but it is also important for educators as well. Learning never stops, and while explicitly teaching students about brain plasticity is a powerful first step for the development of a growth mindset, it is not enough on its own. Educators need to also teach students how to be metacognitive, set their own learning goals, monitor their progress, and use effective strategies to support their learning. Teachers need to routinely use the formative assessment process to ensure students are tackling challenging content at an appropriate level and provide specific feedback to learners as they progress towards their goals. Teachers should praise students for their hard work and their effective use of strategies rather than for “being smart” (Conyers & Wilson, 2020). To promote a growth mindset in students (Tomlinson & Sousa, 2020):

- Explain, teach and reflect often with students on key aspects and benefits of growth mindsets.
- Teach students the skills, attitudes and habits of mind that help someone develop a growth mindset.
- Establish a classroom culture of achievement and quality work. When students are part of a group in which peers pull together for mutual growth and success, it's far more likely that individuals will believe in their ability to succeed and will work toward such success.
- Teachers need to understand their own mindsets. They need to observe themselves in action and reflect on which students they easily respond to with interactions that foster confidence and an expectation of improvement, and which students they find it more challenging to believe in. Then teachers should use that information to grow, just as they hope students will grow.
- Know that teaching with a growth mindset also involves belief, hard work and smart work. Wanting to believe in the capacity of each student is a great start. Enacting those beliefs is tougher; it involves ensuring that, every day, each student moves one step beyond where they began the day or class period. Students must consistently observe



themselves progressing, which will fuel their motivation and effort. Such progress can only happen when teachers begin where a student is currently functioning along their trajectory of learning. The challenge is in learning to help each student move ahead starting from that learner’s point of entry into the lesson.

Self-efficacy and mindset work together in determining a student’s motivation and willingness to engage in the learning process. Students who have high self-efficacy along with a growth mindset are more likely to successfully navigate setbacks when they occur. Even when they experience failure, noticing a gradual improvement in skills over time gives them the confidence they need to ultimately achieve the goal (self-efficacy) by increasing effort and abilities (growth mindset).



Evidence-Based Instructional Practice # 2: Clarifying and Sharing Clear Learning Goals

Introduction

Critical to providing equitable learning environments is ensuring that teachers and students have access to a local standards-aligned curriculum supported by evidenced-based instructional practices and high-quality instructional resources. Educators also must create a classroom culture in which students feel safe and supported in meeting the intended learning outcomes. A first step when implementing the local curriculum at the classroom level is to ensure that both the teacher and the students have clarity of the intended learning outcomes for each unit of instruction and what they must do to reach those outcomes.

In defining teacher clarity, Fendick (1990) states that it is a combination of clarity in regards to (1) organization, (2) explanation, (3) examples and guided practice, and (4) assessment of student learning that are all aligned to clear learning expectations. Teacher clarity requires that teachers have a deep understanding of what students must know and be able to do to reach the grade-level expectations outlined in the *Kentucky Academic Standards* (KAS) and then use that clarity to plan meaningful lessons designed to help students reach those expectations.

However, in order to improve student outcomes, the teacher needs to ensure that students also have clarity in what they are learning. Research shows that when teachers help students understand what they are learning, why they are learning it and how they will know if they have learned, student achievement increases (Fisher, Frey, Amador, & Assof, 2019). Teachers help students gain this clarity by consistently clarifying and sharing the learning goals, relevance and success criteria as a part of ongoing instruction each day.

- **Learning goals** clearly describes what students need to know, understand and be able to do by the end of the lesson or a series of lessons.
- **Relevance** helps the students understand the purpose or the “why” behind the learning.
- **Success criteria** describe the evidence students must produce to show they have achieved the learning goals.

Why are clear learning goals critical to student success? How do teachers gain clarity and then share that clarity with their students? This section will focus on (1) **current brain research and the need for clear learning goals** (2) **starting with teacher clarity**, (3) **establishing student clarity**, (4) **developing student understanding of the learning goal and success criteria** and (5) **co-constructing success criteria**.



Brain Research and the Need for Clear Learning Goals

In order for the brain to learn, it must first commit to learning. All learning requires what Kahneman (2011) describes as “effortful thinking.” Essentially, the human brain has two operating systems: a fast-thinking brain and a slow-thinking brain. The fast-thinking brain works quickly with little effort because it utilizes prior knowledge that has become automated. The slow-thinking brain, which is generally in charge, requires a greater level of attention and effort and can become easily distracted. It also is reluctant to invest more energy and effort than is strictly necessary. However, in order to acquire new learning, the brain must maintain focused attention, process information, and reflect on the learning, all of which require intense focus, effort and energy. (Goodwin, 2020).

The first step in the learning process is to actually get students to commit to the learning. When students commit to learning, it signals the brain to pay attention to the information in the sensory register so it can enter the brain's immediate memory and keep the student focused long enough for the information to move into working memory (Goodwin, 2020). How do teachers help students commit to learning and engage their brains in effortful thinking?

In order for students to commit to learning, research shows they must first understand what they are supposed to learn and why they are being asked to learn it. Then, once students see the value in the learning, they must believe they can actually learn it and know what it looks like when they get there. Ultimately, to commit to learning, students need to tell themselves two things: (1) *This is interesting and important*, and (2) *I believe I can learn/master it* (Goodwin, 2020). At the classroom level this can be achieved when teachers share and clarify the **learning goals**, **relevance** and the **success criteria** of the learning with the students and then use those to drive instruction and assessment.

When students know what they are learning, why they are learning it and believe they can meet the expectations, it promotes student ownership in the learning process. Students not only have an understanding of the purpose of the learning, but also how they will be held accountable for making their thinking visible in terms of what they need to say, do, make or write to demonstrate their understanding of the intended learning outcomes (Goodwin, 2020; McTighe & Willis, 2019). This helps students know where to focus their time and energy and where their brain needs to sustain “effortful thinking.” According to Gazith (2021), when students have a clear sense of purpose and direction, it helps them “understand what they’re preparing to learn and how it will be assessed. This facilitates their ability to grasp the material and identify desired outcomes, and also encourages them to effectively develop autonomy” (p. 27).

Additionally, when students can clearly see the path to reaching the intended learning outcomes, it can increase their motivation to engage in the learning because they can see



themselves making progress. When students experience a series of small wins as they move along the pathway to mastery, they are more apt to stay committed to the learning. It also provides students with an internal sense of control and helps promote a growth mind-set as they tackle more challenging content (Goodwin, 2020). According to neuroscience, when students have clarity of the learning goal, relevance and the criteria for success, it positively impacts student motivation and their ability to organize and focus their efforts, which leads to increased academic performance. “Conversely, when the goal is unclear or irrelevant to students, it is unlikely that they will maintain attention, try their best, or persist when learning becomes challenging” (McTighe & Willis, 2019; p. 55).

Research shows that clarity in learning also increases student’ sense of self-efficacy. When students believe they can be successful at a particular task or assignment, they are more likely to persist in their work, especially in the face of challenge. It also can help decrease student anxiety and help them better connect new learning to prior knowledge (Alamrode & Vandas, 2018). “When students feel that they understand the criteria by which their work will be judged, they also have some sense of control over their work and are poised to be strategic, self-regulators. It takes both an understanding of the learning goal and an understanding of the success criteria to foster self-efficacy and self-regulation” (Moss & Brookhart, 2009; p. 28-29). Table 5.5 below highlights some of the major differences in the classroom culture when clear learning goals are present or missing as an on-going part of classroom instruction (Grift & Major, 2018; p. 89-90).

Table 5.5. *Classrooms Where Learning Goals are Evident vs Missing*

When Clear Learning Goals are Evident	When Clear Learning Goals are Missing
<ul style="list-style-type: none"> • Higher levels of student achievement linked to the opportunity for focused attention on the elements that are most critical to the learning experience • Deeper and richer dialogue in the classroom that centers on the key concepts, knowledge, skills and dispositions being taught • Higher levels of accountability for learning at a variety of levels, including student-to-student, student-to-teacher and teacher-to-student 	<ul style="list-style-type: none"> • A lack of understanding of why the learning is taking place and the relationship it has to both prior knowledge and expected knowledge acquisition • Higher levels of disengagement in learning processes and tasks, both inside and outside of class • Greater incidents of behaviors that disrupt the learning of self and others • More time spent teaching aspects of the content that should need less time, and



<ul style="list-style-type: none"> • Fewer justifications for lack of learning success by both the teacher and the learner • More explicit language used by the teacher and the learner in classroom conversations • A greater understanding of what is needed to be successful as a learner • Fewer assumptions by teachers of students' progress and more success in providing strategies to support them in their individual learning needs • Clear alignment of tasks, activities and assessments that support the learning of the expected outcomes 	<p>less time spent teaching aspects of the content that need more time</p> <ul style="list-style-type: none"> • Teacher dialogue that centers more on tasks rather than on the key learning that is being explored • Tasks, activities and assessments that are not aligned to the knowledge, skills and dispositions being taught • Students who express doubt about the competence and quality of the teacher and teachers who express doubts in the competence and quality of the learner due to lessened expectations
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Starting with Teacher Clarity

In order for teachers to support students in understanding the purpose of the learning and what success looks like, teachers must have clarity around what the standards are asking students to know and be able to do. However, often when teachers are asked about their learning goals for a lesson, they respond with, “I’m going to have the students do...” In this case, the teachers are focused on the activities that students will do rather than on the learning that should result from students engaging with those activities. When teachers focus on the activities students will do without a clear understanding of the intended learning, it is unlikely students will learn what they need to learn (William & Leahy, 2015).

According to Gazith (2021), even if teachers have a sense of the learning goal, “without a clear articulation of what success looks like, it is very challenging, if at all possible, to create effective lessons that teach students these tacit goals” (p. 27). When teachers can clearly articulate what students need to know and be able to do, why they need to learn it and how they will know they have learned it, they can then use that clarity to plan effective lessons that focus on helping students reach those expectations. Teachers need to shift their thinking from what they will teach to a focus on what students will learn and then plan effective lessons that help students reach those goals (Gazith, 2021).



The first step in teachers gaining this level of clarity is to analyze the [KAS](#) to identify what students must know and be able to do within each unit of instruction to meet the grade-level expectations. This analysis helps teachers determine the content, concepts and/or skills students must master on their way to meeting the full depth of a standard or group of standards. This process is best achieved when teachers work collaboratively in Professional Learning Communities (PLCs) to address two critical questions: (1) What do students need to know and be able to do? and (2) How will we know they have learned it? When teachers work together to answer these questions, it helps to promote equitable learning environments in which all students are held to the same grade-level expectations, as well as access to grade-level learning experiences and tasks aligned to helping students reach the full depth of the standards.

As teachers analyze the [KAS](#) for the grade-level standards in each unit of instruction, they need to focus in on the critical components within each document. The purpose of the critical components is to provide greater clarity in what the standards are specifically asking students to know and be able to do to meet the expectations of the standards. Examples of the components include multidimensionality, clarifications and progressions. For example, within the *KAS for Reading and Writing*, the multidimensionality component highlights the three dimensions built within each standard: Content, comprehension and analysis. By specifying the three dimensions separately, the standards document better communicates the intent of each standard so that local instruction and assessment will align to the intended depth.

The PLC should focus on examining each component and the connections between the components and the standards, as well as how those components can support teachers in designing standards-aligned instruction, grade-level assignments and classroom assessments. [The Breaking Down a Standard Resources](#) are available from the Kentucky Department of Education (KDE) to assist teachers in analyzing content area standards.

Once teachers have an understanding of the standards, they should then organize those standards into around big ideas and/or questions to help deepen student understanding and engagement with the content in a more meaningful, relevant way. This helps to avoid students seeing the content as a set of isolated information, skills or processes. When students are tasked with answering big, significant questions, it taps into their curiosity and increases their motivation to engage in the learning. According to Goodwin (2020), the key is to develop open-ended questions that are challenging and provoke deep thought, or even debate, among the students. Whether the questions are provided by the teacher or developed in collaboration with the students, they should require students to learn and analyze new information, evaluate pros and cons, or make a personal decision grounded in the evidence.



Based on the analysis of the standards and the big ideas or questions that will drive the unit, teachers then derive the learning goals and success criteria that guide teachers as they design questions, tasks and activities aligned to the intended learning outcomes. In order for teachers to develop a deep understanding of the learning goals and the success criteria in a way that impacts student learning, they need to be able to answer questions such as (Ruiz-Primo & Brookhart, 2018; p. 36-37):

- What is to be learned?
- Why am I teaching this content?
- Why is this learning important for my students in the context of the unit/module/topic?
- How are these learning goals to be achieved? What instructional activities and tasks will help my students make progress in their learning?
- Why are the activities in this unit sequenced the way that they are?
- How does each activity contribute to the achievement of the overall learning goals?
- What specific evidence will show that those foundational elements have been built? How will I know that students have learned what I intend? What evidence do I need to demonstrate that the learning goals have been met?

Establishing Student Clarity

Once teachers have gained clarity on what students need to know and be able to do to meet the standards' expectations, they must help students develop that same level of understanding. This starts with teachers sharing the learning goals, relevance and success criteria with the students. Often times teachers themselves may be clear on the learning goals when planning lessons, but when learners remain unaware of them, it can negatively impact student outcomes (Fisher, Frey & Hattie, 2016). To help students gain the clarity needed to engage in the learning process, research recommends three questions students should be able to answer in regards to their learning each day (Fisher, Frey, & Hattie, 2021):

- What am I learning?
- Why am I learning it?
- How will I know I have learned it?

Fisher, et al. (2021), argues that students should be able to articulate the answers to these questions regardless of where they might be in the learning process. When teachers and student use these questions to guide classroom practice and assessments, students will have a better understanding of the learning expectations and what is required for success. Each question focuses on a specific component of student clarity needed for the brain to commit to learning. When students have a clear vision of the end point, when they are required to do something to learn, and have specific criteria to use to monitor and adjust along the way, it



makes the journey to the intended learning outcome possible and increases the likelihood of success in reaching the goal. Students have a greater sense of what they can and should do to make their work measure up to the criteria and the goal. “Students can meet goals only if they are actually working toward them, and they can’t work toward them until they understand what they are” (Moss & Brookhart, 2009; p. 28). Table 5.6 summarizes the three clarity components and their characteristics that empower students to answer the three clarity questions.

Table 5.6. *Components of Student Clarity and Their Characteristics*

Three Clarity Questions	Clarity Component	Characteristics
What am I learning?	Learning Goals	<ul style="list-style-type: none"> • Also referred to as learning intentions, targets, objectives or purpose • Brief statement that describes clearly what students need to know, understand and be able to do by the end of the lesson or a series of lessons • Represent the “destination” of where students are going • Can focus on knowledge, skills and/or concepts and should be aligned to the grade-level standards • Focus on the intended learning, not a list of activities that students will do
Why am I learning it?	Relevance	<ul style="list-style-type: none"> • Addresses the “why” behind the learning • Can link to learning outside the classroom, learning about yourself as a learner, and/or needed for future learning
How will I know I have learned it?	Success Criteria	<ul style="list-style-type: none"> • Statements that describe the evidence students must produce to show they have achieved the learning goals • Provide a “map” to the learning destination • Act as major checkpoints along the way for teacher and students to know how they are progressing • Specific, concrete and measurable and become the foundation for classroom assessment



		<ul style="list-style-type: none"> • Used as the basis for teacher feedback, peer feedback and student self-assessment • Are supported, when necessary, through questioning, modeling, and analysis of student work examples
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The Role of Learning Goals – What am I learning?

As learners move throughout the day, the brain is constantly predicting and evaluating each situation based on previous experiences and the current context. This allows the brain to budget the body’s energy resources accordingly and to prepare for action. When students know the goal of the learning and are able to zero in on that goal, the brain knows where to focus and how to direct the body’s resources needed for attention, planning and action (Posey, 2019). Understanding the learning goals prevents students from falling back to the lowest rung on the ladder - compliance. Learning goals allow students to see the relationship between the tasks they are completing and the purpose for the learning (Frey, Hattie, & Fisher, 2018).

Teachers need to establish the learning goal with students for each lesson or series of lessons, revisit the goal throughout the lesson and use it to formatively assess where students are to determine next steps in instruction. **Learning goals don’t have to be used exclusively at the outset of the lesson and may be withheld until after a period of exploration or discovery has occurred** (Fisher, et al., 2019). Yet, truly establishing the learning goal requires ongoing investment to ensure students understand what they are learning and what they will be asked to do with that knowledge. It is the ongoing act of making the learning meaningful and relevant to the student. Effective teachers reestablish the learning goal multiple times during a given lesson, particularly during transitions and when students need redirection back to the purpose of the learning (Fisher, et al., 2016).

Learning goals should clearly convey what students will be learning and should be used to drive classroom instruction and assessment for both the teacher and the students. There are a variety of ways to write learning goals including using sentence stems such as, “I am learning...” or “We are learning...” Whichever style a teacher chooses should remain consistent to provide structure for the students. (Fisher, et al., 2021).

The Role of Relevance - Why am I Learning It?

Once students understand the learning goal, it is important to help them see the relevance of the learning. Emotion is at the core of the brain’s decision to engage in “effortful thinking.” When teachers connect the learning goals to authentic and relevant experiences, it can spark curiosity in a student, which causes the brain to take notice and want to explore the topic more (Posey, 2019). “When we instruct students to learn facts, details, and procedures, but don’t



explain why this knowledge is essential, why they need to learn it, and who uses this knowledge in real life, the learning has limited value for the students” (Gazith, 2021; p. 31)

When teachers take the time to address the relevancy of the learning, it not only fosters student motivation, it also helps to deepen student learning as they make connections between the learning goals and the larger concepts within the discipline. Below is a list of three approaches teachers might use to make learning relevant for students (Fisher, Frey, & Quaglia, 2018):

- **Application Outside the Classroom Walls:** This is when students see that the content, concepts and/or skills can be used outside the walls of the classroom. This might include ways in which it is used in other disciplines or by other people in different aspects of life. It can't be too far in the distance but understanding that learning has utility beyond the confines of the four walls of a classroom can guide students' attention.
- **Learning About Yourself:** This involves students learning more about themselves as learners and making personal connections between the learning and their own identity. Due to students' own unique background and experiences, what may be relevant to one person may not be relevant to another. Allowing students opportunities to make those personal connections to the content helps increase their motivation to engage in the learning.
- **Needed for Future Learning:** This is when the teacher helps students to see that the current learning will be used to help prepare them for upcoming content either within that specific course or in a future course.

A possible strategy for addressing relevancy in a lesson is adding a sentence frame such as, “this will help me to...”, when presenting the learning goal and success criteria. The teacher can then open up a dialogue with students in order to co-construct relevancy. To help students connect back to the relevancy at the end of a lesson, teachers can ask students questions, such as, “Based on today’s learning, what are you curious about? Has this content raised any questions for you?” (Fisher, et al., 2019).

The Role of Success Criteria – How Will I Know I Have Learned It?

Once students understand what they are learning and why it is important, they also must know what success will look like when they achieve the goal. While the learning goal provides the destination, success criteria provide a map for how to reach the destination with clear checkpoints along the way. Fisher, et al. (2018), argues that too often what success looks like is kept a secret from students, which can cause anxiety as they struggle to understand what the teacher expects. However, when students have a clear understanding of the success criteria, it empowers them to monitor their own progress and not to be overly dependent on the teacher



to tell them when they have reached the goal. They are able to use the criteria to set their own goals, which helps to increase student motivation and investment in the learning process.

According to Fisher, et al. (2019), success criteria work because they tap into some of the basic principles of human motivation. People tend to compare their current performance or ability to a clear goal and when there is a gap between where they are and where they want to be, it creates cognitive dissonance. The brain is then motivated to close the gap and get rid of the dissonance by working to assimilate or accommodate information and ideas needed to reach the goal. “Ultimately, when students use success criteria to set and achieve their own goals for learning, the real magic happens in the classroom. When we achieve goals we’ve set for ourselves, our brains fill with the chemical dopamine. In short, achieving goals feels good and forms a positive addiction” (Goodwin, 2020; p. 42).

Success criteria are typically framed from students’ perspectives and can be written as “I can” statements that help students understand and visualize what mastery will look like and feel like. Goodwin (2020) offers the following sentence starters that can help teachers draft their success criteria and invite students to engage in deep learning:

- I can explain...
- I understand and can discuss...
- I can teach...
- I can defend...
- I can test and prove...
- I understand and can show...
- I can restate...
- I can use...to...
- I can discuss and explain how...
- I can model how to...
- I can demonstrate how to...
- I can draw a diagram that...
- I can choose...
- I can illustrate and explain

Examples of Learning Goals and Success Criteria

The learning goals and success criteria provided in Table 5.7 are meant to help teachers better understand the difference between the two components and how they work together to support student learning. Please note that these are possible suggestions. They are not the only pathways and are not comprehensive to obtain mastery of the standards.

Table 5.7. *Examples of Learning Goals and Success Criteria*

Learning Goal	Success Criteria
We are learning to use patterns from our observations to place different materials into groups	<ul style="list-style-type: none"> • I can explain how I will find patterns in different materials. • I can name the patterns I see in different materials.



<p>based on ways they are the same and different</p>	<ul style="list-style-type: none"> • I can sort different materials into categories based on the patterns I see.
<p>We are learning to identify the central idea of a text.</p>	<ul style="list-style-type: none"> • I can define central idea. • I can list key details of a text. • I can analyze key details to determine the central idea of a text. • I can analyze how the central idea is reflected in a text and cite relevant evidence to support thinking around the central idea.
<p>We are learning to compare fractions.</p>	<ul style="list-style-type: none"> • I can draw models to make fraction comparisons. • I can use the symbols $>$, $<$ and $=$ when making fraction comparisons. • I can explain how the size of equal parts can be used to compare fractions. • I can construct a viable argument and/or critique the reasoning of others to prove whether a fraction comparison is correct or incorrect.
<p>We are analyzing the structure of the U.S. government, including separation of power and its system of checks and balances, through inquiry practices.</p>	<ul style="list-style-type: none"> • I can ask compelling and discipline-specific supporting questions about the structure of the U.S. government. • I can identify the three branches of government and describe the function and roles of each branch. • I can describe the limitations of each branch established by separation of powers. • I can analyze how the system of checks and balances creates a balance of power among the branches of government. • I can use and integrate information from primary and secondary sources to develop claims that



	<p>answer compelling and supporting questions, while noting key similarities and differences in the perspective the sources represent.</p> <ul style="list-style-type: none"> • I can construct explanatory products to convey the diverse perspectives that impacted the founding of the United States. • I can explain different approaches people can take to address local, regional and global problems, using examples from U.S. history.
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Developing Student Understanding of the Learning Goals and Success Criteria

In harnessing the power of learning goals, relevance and success criteria, teachers must ensure that students have a deep understanding of each. Simply telling students the learning goal and posting a list of success criteria on the board does not equate to effectively developing student understanding of each component. Effective teachers use multiple modes to share the learning goals and success criteria with students (Ruiz-Primo & Brookhart, 2018).

Moss & Brookhart (2009) state that “the single most important method for routinely sharing the purpose is using assignments that match - really match - the learning goals. It is in the assignment that the teacher translates the learning goal into action for the student. The student will strive to do the assignment, not the abstract goal. When we say the assignment or activity must “embody” the learning goal, we mean that the assignment and the activity is such a close match with the goal that the student would be able to think, “If I can do [this assignment], then I can do [the learning objective]” (p. 25). Other possible strategies for developing student understanding of the learning goals and success criteria include questioning and using examples of student work.

Questioning

One strategy for helping students to gain clarity in their learning is to ask students questions related to the learning goal or success criteria or asking them to explain each in their own words. The teacher also can ask students to share their own attitudes, experiences and prior knowledge that come to mind in relation to the topic of the learning. Teachers can then use students’ responses to help students connect to the relevance and to inform and adjust instruction as needed (Moss & Brookhart, 2009).



McTighe and Willis (2019) suggest that at the beginning of a unit, the teacher might invite students to pose questions about the topic of the unit and have them explore those ideas. One way to do this is to have students create a KWL chart in which they:

- Activate their prior knowledge by asking them what they already **Know** about the topic;
- Pose questions and identify those aspects of the topic about which they are curious and **Want** to learn; and
- Reflect on and record what they have **Learned** as they move throughout the unit.

Goodwin (2020) offers the following questions teachers can pose to students to help them see the relevance in their learning (p.37-38):

- How can I apply this knowledge or skill in my own life?
- What might I gain personally from mastering this learning?
- How might I use this new learning to help others?
- How do adults use this knowledge or skill in the real world?
- How is this knowledge or skill an important building block for my later learning?

Examples of Student Work

When teachers provide students with examples and have students assess and describe them in terms of the success criteria, students develop a deeper understanding of the learning goal and criteria for success (Moss & Brookhart, 2019). William & Leahy (2015) point out two immediate benefits of getting students to look at examples of student work. “First, students are better at spotting mistakes in the work of others than they are at their own work. Assessing one’s own work, as well as assessing the work of one’s peers in the classroom, is emotionally charged, and the emotional resonances can often interfere with engaging in the demands of the task.

However, assessing the work of anonymous others is emotionally neutral, so students are able to focus more effectively on the task. Second, when students notice mistakes in the work of others, they are less likely to make the same mistakes in their own work” (p. 42). The list below provides possible ideas for using examples of student work:

- Provide students with top quality examples that meet all the success criteria and have students brainstorm a list of what makes them quality examples (Moss & Brookhart, 2009).
- When using top quality examples, use more than one example to show different styles or ways of meeting the success criteria to inspire student creativity (Almarode & Vandas, 2018).
- Have students analyze a range of examples, sort them into quality levels, discuss the qualities and develop a description of what quality looks like aligned to the success



criteria. When using a range of examples, Moss and Brookhart (2019) recommend using examples from anonymous sources or teacher-created examples.

- Show multiple versions of a student’s work that has progressed over time until the student’s work met the success criteria. Ask students to notice how the student improved over time, highlighting the success criteria that the student achieved in each piece of work (Almarode & Vandas, 2018)

Co-Constructing Success Criteria

As teachers move through each unit of instruction, there are different times in which teachers will develop and share the learning goals and success criteria with students. As mentioned earlier, learning goals and success criteria don’t have to be used exclusively at the outset of the lesson and may be withheld until after a period of exploration or discovery has occurred.

Yet, based on the learning goals, there also are times when teachers may want to co-create success criteria with students. **When students are involved in co-constructing the success criteria, it deepens their understanding of what quality looks like, increases student ownership in the learning process and promotes self-regulation** (Clarke, 2021).

When determining whether or not to co-construct success criteria with students, Almarode and Vandas (2018) suggest to **first consider the complexity of the goal**. The amount of time a teacher spends clarifying quality and expectations increases with the complexity of the goal and the time spent in class working toward that goal. If the teacher plans to spend a few weeks on a topic, it would be beneficial to spend significant time co-constructing success criteria with students. In addition, investing time on the front end co-constructing an understanding of the success criteria often saves significant time on the backend because students start with a deep understanding of what success looks like. It also is important to note that co-constructing success criteria does not have to be accomplished in a single lesson. Often, co-construction continues throughout a series of lessons or unit, as teachers provide mini-lessons, modeling and additional examples to further clarify the expectations as students’ learning deepens.

Below is a list of steps to consider when constructing success criteria with students (adapted from Almarode and Vandas, 2018; p. 81-82):

1. Determine **when** to co-construct success criteria with students.
2. Gather the tools students will use: Worked examples, exemplars and/or models.
 - a. Examples of attainment of the learning goal(s)
 - b. Non-examples or works in progress in relation to the learning goal(s)
 - c. Process, steps or multiple approaches to attain the learning goal(s)
3. Determine the method that will be used to share the tools with students.



- a. Studying and differentiating among the examples of student work in small groups to generate success criteria
 - b. Modeling by teacher or students – demonstration with a think-aloud about the thinking process they are using to make decisions about quality
 - c. Worked examples (step-by-step demonstration of how to perform a task or how to solve a problem) modeled and then posted for reference
 - d. Compare success criteria exemplars to other examples that do not fully meet the learning goal or nonexamples to determine which is better and why
4. Generate initial success criteria with students.
 - a. Allow students to share criteria after modeling, examples and exemplars have been shared.
 - b. Add any missing success criteria (i.e., teacher noticing if anything is missing and needs to be added, based on the standards and expectations).
 5. Categorize and organize agreed upon success criteria using tools. This might include:
 - a. A t-chart
 - b. A checklist
 - c. An anchor chart
 - d. Other ways of representing the success criteria
 6. Have students model/practice using the success criteria to provide feedback and set personal goals as to which criteria to work toward next.
 7. Revisit and revise success criteria and goals over time as student learning deepens.

Almarode and Vandas (2018) recommend that the co-constructed success criteria are agreed upon by the class and written in student-friendly language. They should always be paired with examples of student work, exemplars and models of success for student reference. In addition, they need to be organized in a way that is easy for students to monitor their own progress and determine their next steps in reaching the intended learning goal.

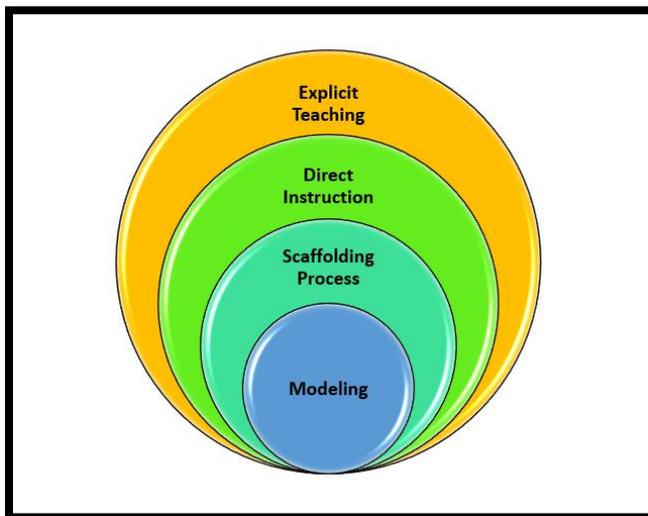


Evidence-Based Instructional Practice # 3: Explicit Teaching and Modeling

Introduction

Consistent research in the field upholds that the quality of day-to-day classroom instruction students receive has a significant impact on their overall achievement. It is imperative that all students have access to high quality, standards-aligned, grade-level instruction. Therefore, as teachers implement the curriculum, they should strategically and intentionally utilize evidence-based instructional practices that support students in reaching the intended learning outcomes. Two interrelated evidence-based instructional practices discussed in this section include explicit teaching and modeling (TNTP, 2018; Hattie, et al., 2021). **Explicit teaching** is a system of step-by-step instructional approaches in which teachers examine the individual elements they are planning to teach and continually check for student understanding. Two essential instructional approaches within the explicit teaching system are direct instruction and modeling (Ashman, 2021). See Figure 5.2 below.

Figure 5.2. *Explicit Teaching and Modeling*



The Role Direct Instruction Plays in Explicit Teaching

Educators often unintentionally use the terms *explicit instruction* and *direct instruction* interchangeably; however, while related, they are not the same. Explicit teaching refers to a whole system, not just an episode within a lesson; whereas direct instruction is one kind of explicit teaching - a pedagogical approach within that system (Ashman, 2021). Research studies support teaching learning strategies explicitly as a student-centered approach. One such study by the National Literacy Panel (2006) found that interactive approaches to student learning are more effective when combined with direct approaches which provide explicit and direct



teaching of specific skills or knowledge (August & Shanahan, 2006; Moore, 2010). While the need for explicit teaching is strongly grounded in research, it is sometimes unpopular in education as it is viewed as conflicting with more popular education theories including inquiry and project-based learning (Ashman, 2021).

Some educators view explicit teaching as commanding and rigid, upholding that students should come to know information on their own through exploration and discovery rather than through explicit instruction. However, author and researcher Greg Ashman (2021) argues that discovery and explicit learning can co-exist; both have a purpose and place in today's classrooms. Because a large majority of what is often observed in secondary explicit teaching is "suboptimal" (i.e., standing at the front of the classroom lecturing), leaders do not get an accurate sense of what explicit instruction truly is because they do not get enough opportunities to observe it in action.

Explicit Instruction and Teacher Effectiveness

Explicit instruction's true effectiveness comes from its ability to encourage teachers to examine the individual elements they are planning to teach and continually check for student understanding. This key element of explicit instruction forces teachers to think through the step-by-step processes that students must follow to reveal when students do not understand or have misconceptions. Regardless of their educational philosophies, many educational experts have consistently observed the following teacher behaviors during effective explicit instruction. Teachers of explicit instruction consistently (Ashman, 2021):

- Optimize instructional time;
- Use active teaching by presenting concepts to students with a balance of conceptual and procedural knowledge through supervision, encouragement and the building on of initial presentations;
- Are proactive in classroom management practices;
- Demonstrate clarity in communicating learning goals, success criteria and delivery of content;
- Are enthusiastic and warm toward students;
- Provide well-paced "Goldilocks" lessons (not too fast and not too slow);
- Teach to mastery by providing adequate review and feedback; and
- Possess adequate subject matter knowledge where the teacher is viewed as a full director of the learning, not a facilitator or guide (Ashman, 2021).

While explicit teaching is a system of instructional approaches, direct instruction is a critical approach type within that system. For some educators, direct instruction conjures up negative connotations as a scripted, inflexible instructional approach that devalues teacher autonomy.



While it is a commonly misunderstood instructional design strategy in the field, many educators are quick to discount its effectiveness because they do not understand the full scope of benefits direct instruction can provide students when learning new content. **Direct instruction “offers a pedagogical pathway that provides students with modeling, scaffolding and practice they require when learning new skills and concepts” and according to continued research, it remains one of the most effective means of teaching complex content (Ashman, 2021).** In fact, according to John Hattie’s meta-analyses research, direct instruction has an effect size of 0.59 - more than one year’s growth in one year’s worth of time. Therefore, we are likely to see student gains when direct instruction is implemented as intended (Fisher, et al., 2020).

Developed by Siegfried Engelmann and Wesley Becker, direct instruction originally included scripted and carefully sequenced lessons, but have more recently moved into teacher-directed, highly structured lessons based on explanation, demonstration and practice. These more current models of direct instruction focus on student engagement, small group instruction and specific, immediate feedback. One of the primary benefits of direct instruction is that it follows a set methodology, which often uses non-examples to avoid student misconceptions from arising in the first place. Teacher misconception exists that direct instruction is only beneficial in developing basic skills. However, compared to control groups in basic skills, direct instruction groups produced larger gains in student problem solving and self-esteem. In addition, students receiving direct instruction had higher graduation rates than students who did not receive direct instruction following studies many years later (Ashman, 2021).

Lesson Sequences for Direct Instruction

Models of direct instruction are highly controlled to include a sequencing of concepts, and, unlike traditional instructional models and programs, the planning and delivery of direct instruction are seen as separate tasks. Educators plan the responses they desire from students and reinforce those with praise (Ashman, 2021). **Current models of direct instruction lessons suggest the following general pattern or sequence:**

1. Review of previous learning briefly at the beginning of the lesson going from known to new information.
2. State goals at the beginning of the lesson.
3. Present new material in small steps with practice for students after each step.
4. Provide clear, detailed instructions and explanations.
5. Include a high level of active practice for all students.
6. Check for student understanding, ask many questions, and collect responses from all students.
7. Guide students during initial practice.
8. Use explicit instruction and practice for seatwork tasks, monitoring students as they work (Fisher, et al., 2020).



Acquiring New Information and the Role of the Teacher

So how do we ensure that all students are given the same opportunities to learn the content using the best approach possible? Is direct instruction the best approach for all learners? We know that *giving* students information is not enough; they must come to *understand* the content they are learning. According to researchers Grant Wiggins and Jay McTighe, learning for understanding “requires that curriculum and instruction address three different but interrelated academic goals: 1) helping students **acquire** important information and skills, 2) **make meaning** of that content, and (3) effectively **transfer** their learning to new situations both within school and beyond it.” Teachers can take on varying roles in the classroom as they attempt to support students in achieving these three academic goals. By incorporating various instructional approaches, the classroom teacher can assume the role of direct instructor, coach or facilitator.

While all three roles are needed and serve different purposes in the classroom, **explicit teaching and modeling occurs when the teacher is activating the role of direct instructor and the primary goal is to help learners acquire basic information and skills, particularly information that is new or complex in nature.** Examples of direct instructional methodologies can include lectures, multimedia presentations, convergent questioning, demonstrations, modeling, guided practice and feedback (Wiggins & McTighe, 2008; Ashman, 2021).

When too much information is presented to students at once, it becomes increasingly more likely that student misconceptions will develop. By teaching small increments of material, providing time for guided practice and then checking for student understanding, teachers are able to limit the number of misconceptions that students develop (Rosenshine, 2012). While **direct instruction is not necessary for all instructional lessons**, author Greg Ashman suggests there is no other instructional approach in the field that has been found to better help students acquire new or complex content information and skills (Ashman, 2021).

So, what does direct instruction look like in today’s classrooms? Some educators tend to visualize direct instruction as lecture-oriented, teacher-centered presentations; however, this image is antiquated and far from accurate. Direct instruction allows teachers to flexibly accommodate the needs of lower and higher performing students by providing teachers autonomy to choose feedback through wording and examples that best match students’ responses. The focus of direct instruction lessons is not on *how* to present skills and concepts to students, but rather on what students know, don’t know and where they need additional support. In most cases, direct instruction is presented to students in small, homogenous flexible groups where instruction is individualized and adjustments within and between groups are made weekly based on analysis of ongoing student formative assessment evidence (Stockard, et al., 2018).



According to Robert Marzano (2017), direct instruction is most effective when it contains the following elements:

Element #1: Chunking Content - New information is best presented in small, incremental and digestible amounts called chunks (Marzano, 2017). **Chunking helps to move information from long-term memory into our working memory so we can manipulate it (Ashman, 2021).**

Moving content information by chunks helps in making more efficient use of short-term memory and helps to avoid information overload (Gazith, 2021). When teachers chunk content, they present information and stop at natural breaks for students to process and reflect. When presenting new, declarative knowledge, the chunks are made up of details that logically go together. Steps in a process are chunked together when presenting new procedural knowledge. Pre-assessment data is crucial here because when students demonstrate that they already know about specific content, the chunks presented to them can be larger; the less they know about content the smaller the chunks should be (Marzano, 2017).

Element #2: Processing Content - When learning is paused for the processing of new information to occur, students need to be engaged in strategies that help to facilitate deeper understanding of that content in intentionally planned and structured ways. Doing so ensures that students are engaging with the content at the depth and rigor intended within the *Kentucky Academic Standards (KAS)* and in a way that augments individual students’ thinking. Table 5.8 below provides a few example strategies teachers could use to facilitate processing content with students. Regardless of which strategy is selected, it is important that teachers consider selecting a strategy which allows learners to *actively* engage in the content and clearly articulate the learning goals and success criteria (Marzano, 2017).

Table 5.8. *Example Processing Content Strategies*

Strategy	Description
Thinking Hats	The teacher asks students to process new information by imagining themselves wearing any one of six different-colored thinking hats. Each hat represents a different perspective: white hat (neutral/objective perspective), yellow (optimistic), red (emotional), black (careful/cautious), green (creative) and blue (organizational perspectives).
Collaborative Processing	Students are asked to meet in small groups to summarize the information he/she just presented, ask clarifying questions and make predictions about upcoming information.
Jigsaw Cooperative Learning	The teacher organizes students in teams of equal size based on the number of categories there are in the content (four categories = four team members). Each team member is assigned a content category piece to become an “expert” on and present that content information to the remaining members of the group.



Strategy	Description
Concept Attainment	Students are asked to identify, compare and contrast examples and nonexamples of a concept.
Think-Pair-Share	Students are asked to think critically about a question, pair up with a classmate to come to a consensus on their answer to that question, and then share their response with other groups or the class as a whole.
Scripted Cooperative Dyads	When presented new content students take notes about the main idea and key details. Students are broken into groups of two and students are assigned the role of “recaller” or “listener.” The “recaller” summarizes content without looking at his or her notes, while the “listener” adds missing information and corrects any errors in the “recaller’s” summary. Students switch roles during the next chunk.

* Adapted from content in *The New Art and Science of Teaching* (Marzano, 2017).

Element #3: Recording and Representing Content - This element of direct instruction allows students to record and present the content from what was learned in the lesson. This element allows students **choice** in demonstrating their understanding of new content in **personally meaningful** ways. Students may choose to demonstrate the content using spoken language, written form or a combination of both. Linguistic representations involve the use of language (i.e., written summaries or word webs), whereas nonlinguistic representations depict content in a nonlinguistic form (i.e., dramatic enactments or pictorial models) (Marzano, 2017).

Element #4: Planning - Direct instruction is effective when teachers address the following considerations throughout their planning process (Marzano, 2017):

- Is the content of my lesson important enough to warrant the time involved in a direct instruction lesson?
- How can I intentionally design and deliver direct instruction lessons that help students understand which parts are important? How do those parts fit together?
- How can I chunk the new content into smaller, more manageable bites of information?
- How can I help students process individual chunks and the content as a whole?
- How can I strategically select strategies to help students record and represent their knowledge?

Scaffolding

The concept of **scaffolding** was first introduced in 1976 by Jerome Bruner as “a process that helps a learner to solve a task or achieve a goal that would be beyond his unassisted efforts” (Wood, et. al., 1976). Scaffolds are a temporary support and form of guided practice used to assist a learner when faced with difficult problems, concepts or tasks. As students become



more independent, scaffolds are often withdrawn to prevent the learner from becoming overly reliant on them. Examples of scaffolding tools may include cue cards, checklists or completed task models (Rosenshine, 2012).

One essential form of scaffolding is prompting. **Prompting** can help students access and apply prior learning as a bridge to new learning and moves beyond surface level understanding because it often forces students to apply what they have learned previously to a new learning situation. Prompting may take the form of a reminder, a strong hint, a clue or question and should always be followed by adequate wait time. Prompting is most effective when the teacher has a clear picture of where individual students are along a learning progression in order to formulate a prompt that will successfully bridge to new learning (e.g., moving students up to the next stage along their learning progression) (Fisher, et al., 2021).

Thinking aloud is another form of scaffolding that teachers may use as an instructional model of support for students. Thinking aloud is a way for teachers or learners to verbalize thought processes out loud and provide novice learners with an expert model by allowing thinking to be made visible. By verbalizing learners' thought processes out loud, teachers are able to model thinking that would otherwise be hidden. Asking students to think aloud while solving a problem can help teachers to quickly identify and address student misconceptions by making continual adjustments in their instructional practices (Rosenshine, 2012).

Phases of Teacher Scaffolding

According to Barak Rosenshine's research (2012), to assist students in efficiently learning challenging problems, content or tasks, there needs to be a series of phases that students move throughout when scaffolded by their teacher. These phases of teacher scaffolding along with their descriptions are listed in Table 5.9 below. Each phase incorporates the scaffolding forms of prompting and thinking aloud mentioned previously by utilizing a gradual release of responsibility model whereby the ultimate goal is to achieve student independence as learners.

Throughout these phases, the level of teacher support in scaffolding is decreased as the cognitive load on students increases. Because complex content requires a greater amount of cognitive load for students to process, teachers must start with explicit instruction where teacher supports are greater and student responsibility is low. As students demonstrate increased understanding of the intended learning outcomes, teachers are able to adjust their instructional supports by decreasing the amount of scaffolding they provide to students. While there is flexibility in the order in which teachers may enter into or move throughout the phases (such as beginning with a "you do it together" approach to promote inquiry and problem solving), teachers should intentionally plan for each phase of scaffolding until students reach the final phase, independent practice, and can demonstrate understanding in new learning situations and contexts (transfer) (Rosenshine, 2012; Pearson & Gallagher, 1983; Fisher & Frey, 2008).



Table 5.9. Phases of Teacher Scaffolding

Amount of Student Cognitive Load	Phase of Scaffolding	Student or Teacher Grouping	Description & Examples
Low Cognitive Load	Explicit Instruction “I Do It”	Teacher + Student(s)	Teachers do (or demonstrate) as students observe. Teachers present content using direct instruction with worked samples, worked examples or think-alouds. In this phase, teacher responsibility is highest.
Mid-Low Cognitive Load	Guided Instruction “We Do It”	Small Group of Students	Students and teachers do it together; Shared reading, writing and thinking; Think-alongs/alouds can be utilized by students and/or the teacher.
Mid-High Cognitive Load	Guided Practice “You Do It Together”	Student Triads or Pairs	Student pairs or triads do it together as the teacher supports; Paired reading, writing and thinking; Think-alouds/think-alongs can be utilized by the students. Provides learners with the review and elaboration needed to become fluent and involves the same content material used in Guided Instruction.
High Cognitive Load	Independent Practice “You Do It Alone”	Individual Student	Students do as the teacher watches. Students are close to mastering the content on their own without scaffolded assistance from the teacher. In this phase, teacher responsibility is lowest.

*Created from research by Rosenshine, 2012; Almasi, 2012; Pearson & Gallagher, 1983; Fisher & Frey, 2008.

Modeling

As mentioned earlier, modeling* is a deliberate and purposeful instructional strategy in which the teacher demonstrates a new concept or approach to learning and students learn by observing. **Modeling describes the scaffolding process whereby students learn or acquire new information, skills or behaviors through observation, rather than through trial-and-error or student practice.** Deliberate, purposeful modeling is a powerful instructional strategy which makes learning visible by verbalizing the teacher’s reasoning out loud, explicitly narrating thinking during a problem-solving process as they demonstrate a specific skill. Many initial metacognitive and self-regulatory skills needed for students to be successful as learners begin at a young age through observation and modeling (Salisu, 2014).

Modeling often involves a gradual transfer of responsibility from teacher to student as students



become familiar with the concepts, skills or behaviors being demonstrated. Effective teachers of explicit instruction revisit previous learning, present new material in short steps with lots of practice, continually check for understanding, guide students through shared practice and move students into a period of independent practice (Ashman, 2021). This gradual transfer of responsibility is often referred to as the **Gradual Release of Responsibility Model (GRR)** and purposefully shifts the cognitive load from the teacher as a model to the joint responsibility of teacher and learner; whereby at the end of the process, students are ultimately able to independently practice and apply what they have learned (Pearson & Gallagher, 1983). In fact, explicit teaching is defined by researcher Barak Rosenshine as a “whole system of gradual transfer from teacher to student” (Sherrington, 2019).

*Note: The Modeling Cycle in the *Kentucky Academic Standards for Mathematics* is essential in providing opportunities for students to reason and problem solve. In the course of a student’s mathematics education, the word “model” is used in a variety of ways. Several of these, such as manipulatives, demonstration, role modeling and conceptual models of mathematics are valuable tools for teaching and learning; however, these examples are different from the practice of mathematical modeling.

Cognitive Load and Working Memory: Why is Modeling Needed?

When adults join a gym, having a coach there to teach them how to use the equipment, demonstrating how to conduct various exercises and offering feedback along the way is one of the most efficient ways to learn. When an expert is unavailable to coach, humans often resort to trial and error (discovery learning) or imitation through watching or listening to others. People imitate by repeating another person’s words or copying experts’ actions. Teaching others through demonstration and imitation has most likely been common practice since the evolution of humankind.

Imitation works well for simple tasks but is less effective for complex ones. For example, in trying to learn how to play the piano, imitating a concert pianist would not be an effective or efficient means. Instead, explicit instruction in scales and musical notation through a gradual increase in the complexity of the pieces being learned (easy to hard) would prove more effective. This strategy is referred to as a **bottom-up approach** to learning.

A bottom-up approach “involves breaking expert performance down into small components and teaching these first before reintegrating them.” In a school setting, students are in essence asked to imitate scientists (including political scientists, economists, geographers and historians), mathematicians or writers. Educators “constantly reinvent the idea of learning a complex task by imitating the performance of experts” because teachers often consider it to be more authentic. Complex academic learning is best taught through a bottom-up approach.



Teachers start with a product in mind because they want to see the learning as purposeful rather than inauthentic skills taught in isolation (Ashman, 2021).

On the contrary, a **top-down approach** seeks to emulate the behaviors of experts in hopes of becoming more expert yourself. Top-down approaches exist because some teachers operate on the premise that authentic, real-world projects will motivate students to want to learn (i.e., designing a website). While project-based learning experiences have proven to be motivating for some students, **teachers often underestimate all of the steps needed to complete a complex task because they fail to think through where students are in their learning journey and the steps students need to understand to get there.** What if the computer science student cannot use a desktop computer? If not, then a bottom-up approach would need to be implemented to explicitly teach the student in smaller, more immediate objectives (i.e., how to use a mouse, power and log on to the computer, access the internet, or locate information via a browser). While website design contains skills that are observable (i.e., inserting hyperlinks) many of the skills associated with expert performance in academic subjects are latent, cognitive skills that cannot be observed. These skills are often neglected because they involve thinking that is not visible; it occurs within students' minds (Ashman, 2021).

Cognitive load refers to the number of items to be processed in working memory (Ashman, 2021). Learning cognitively demanding knowledge and skills by mimicking the behavior of experts (as in a top-down approach) is fundamentally flawed because experts learn more from solving problems; they already have mental maps of solution methods in their working memory (Sweller & Sweller, 2006). Working memory where information is processed can only handle a few bits of new information at once. Too much new information swamps working memory and may be confusing to students because their working memory may not be able to process the additional information. This is why a bottom-up approach to learning is most effective when presenting students with new or complex content since the material is often easier to “digest” when chunked into smaller, more manageable pieces (Rosenshine, 2012; Marzano, 2017).

Effective teachers present material in small amounts and support students as they practice by dividing information into small steps with modeling/practice at each step. Students need cognitive support to learn and solve new problems. **Modeling and thinking aloud while demonstrating how to solve a problem are examples of effective cognitive support.** For new information to be added to working memory, sufficient rehearsal needs to occur during guided practice. Teachers help to facilitate the rehearsal process when they ask students questions. Questioning requires students to process and rehearse new material. In order for this rehearsal to be effective, students need feedback to process new material and ensure they do not store misconceptions or partial information in working memory. Teaching small amounts of material followed by guided practice and checking for student understanding (formative assessment) can help to minimize misconceptions (Rosenshine, 2012).



Forms of Modeling

Four primary forms of modeling include worked examples, work samples, think-alouds and think-alongs. **Worked examples** are “a step-by-step demonstration of how to perform a task or how to solve a problem,” which may be used in any content area, but are most commonly applied in mathematics, science or writing where numerical or written problem solving are frequently found (Fisher, et al., 2020; Rosenshine, 2012). Worked examples have an effect size of 0.37 (Hattie, 2012) and can ignite student thinking as they try to determine why the teacher or person solving the problem made the step-by-step decisions along the way. Teachers may decide to provide students with incorrect worked examples to see if students can find the step or steps that contain errors. By sharing their thinking aloud while problem solving, students are able to use and incorporate those mental models into their own practices (Ashman, 2021; Fisher, et al., 2020).

Research by John Sweller (2019) indicates that students who were given worked examples to study following explicit instruction in how to solve a problem, outperformed students who were merely given the problem to solve. Using worked examples helps to reduce students’ cognitive load as students are able to focus their attention on the most important lesson components. This can create a “expertise reversal effect” as students start listening to explicit instruction and dialogue from the teacher and internalize and convert that same language into their longer-term memory. Hearing the problem solving of the teacher and reducing redundant parts, gets at the heart of the gradual release of responsibility from the teacher (Fisher, et al., 2020).

Work samples are artifacts which help students to arrive at shared descriptors of quality and to allow them to see how the work could look. These artifacts offer a standard for all other work to be measured against. They differ from worked examples in that work examples are more about the process and thinking involved than the completed product. Work samples provide students with a benchmark for their end product and can be students’ own work, peers’ work or students’ work from other classes (Hoffer, 2020).

Think-Alouds vs. Think-Alongs

Think-alouds share the inner workings of teachers’ brains as they process information aloud, making their invisible thinking visible. Think-alongs ensure that students are at the center of this engagement process by following an intentionally planned sequence of steps using “I” statements to increase clarity for students and ignite empathetic listening. In essence, think-alongs invite students along in the thinking process. By using “I” statements, students are invited into the thinking process in ways that second-person directives do not. Table 5.10 below provides a planning structure for think-alongs as well as some practical “I” statement language examples for each (Fisher, et al., 2020):



Table 5.10. Think-Along Planning Tool with Examples

Component	“I” Statement Language Examples or Places in the Text
Name the strategy, skill or task.	“I am going to think out loud about how I noticed metaphors being used in this passage.”
State the purpose of the strategy, skill or task.	“I know that good writers will often include metaphors as a literary device in their writing to emphasize a theme or symbolic message or to help make their writing more interesting to the reader.”
Explain when the strategy or skill is used.	“The first thing that got me noticing that there were going to be metaphors coming was in the second line of the first paragraph when the author states, “Lisa’s suggestion was just a Band-Aid for the problem.””
Use analogies to link prior knowledge to new learning.	“It’s like when I heard someone say their brother’s room is a pigsty. His brother’s room is not really a pigsty; that person was trying to communicate the message that his room was extremely messy.”
Demonstrate how the skill, strategy or task is completed.	“I’m going to show you the metaphors I saw in the first paragraph. First he says, ‘Lisa’s suggestion was just a Band-Aid for the problem...’ Then he says, ‘Her voice was like thunder.’ At the end of the paragraph he says, ‘Her message was as clear as mud. Three times in that paragraph the author is using metaphors to describe how Lisa is communicating to them in a loud, yet unclear way.”
Alert learners of errors to avoid.	“As a writer I can use metaphors to compare two unlike things effectively in my writing and really grab the reader’s attention, but I have to be careful that I am choosing metaphors that match the message I am trying to send.”
Assess use of the skill.	“I’m going to make a note in the margin where I noticed metaphors and jot down what message I think the author is trying to send here. I want to be able to look back and see if this message continues throughout the text or if it changes.”

*Created based on content in *The Distance Learning Playbook, Grades K-12* (Fisher, et. al., 2020).

By providing prompts, modeling use of those prompts and guiding students as they develop independence, teachers are able to convey many of the skills taught in classrooms (Rosenshine, 2012). Teachers and learners may choose to incorporate the following modeling moves to deepen student understanding:

- Demonstrating processes integral to learners’ independence;
- Modeling precise academic language to help facilitate learners’ discourse; or
- Thinking aloud, modeling or demonstrating one or more specific strategies to support metacognition (Hoffer, 2020).

Within the structure of a workshop, modeling and/or thinking aloud to better prepare students for their work in guided/independent practice often occurs within the mini lesson (also known



as the crafting portion of the lesson). Reflection or share time allows the teacher to model reflecting on use of the strategies within the lesson through think-alouds (Hoffer, 2020).

General Resources to Support Implementation of Evidence-Based Instructional Practice

#3: Explicit Teaching and Modeling:

- [Model Curriculum Framework](#)
 - **Balanced Assessment Section:** This section of the *Model Curriculum Framework* is designed to provide guidance on how teachers and leaders can implement a comprehensive, balanced system of assessments to ensure equitable, high-quality and reliable assessment practices. It focuses on developing an understanding of the formative assessment process and how strategies such as explicit teaching and modeling are used to drive the process as teachers interpret and act on evidence of student learning.
- [Evidence-Based Instructional Practices \(EBIPs\)](#): This six-part professional learning series takes a closer look at what is meant by evidence-based instructional practices, as well as the importance of effective implementation, intentional planning and gathering evidence to determine the impact on student learning. This series will examine six evidence-based instructional practices teachers can use to support learners in reaching expectations within the *Kentucky Academic Standards* and the local curriculum through explicit teaching and modeling across disciplines.



Evidence-Based Instructional Practice # 4: Discussion

Introduction

While creating a classroom culture that supports students in meeting the intended learning outcomes is critical to establishing equitable learning environments, how teachers and students operate within that environment acts as a powerful means to improve instruction as well. According to Zaretta Hammond and John Hattie, conversations are one of the most powerful practices teachers can use in classrooms to promote higher achievement (Hammond, 2020; Hattie, 2012). The New Oxford American Dictionary defines **discussion** as “the action or process of talking about something in order to reach a decision or to exchange ideas.” Also known as discourse, dialogue, talk or conversation, discussion is a pedagogy that empowers and transforms learners, making student learning visible and creating a heightened sense of classroom community (Ostroff, 2020).

Students are more apt to be able to solve their own problems and generate their own questions when first given opportunities to talk and collaborate (Cifone, 2013). Therefore, in meta-analyses conducted by John Hattie, dialogues between and among peers are a powerful way to improve instruction with an effect size of 0.82 - over two years' worth of growth in one year's time (Fisher, Frey & Hattie, 2016). Once students have acquired enough knowledge to begin grappling with relationships between ideas, they reach an ideal place for discussion with peers as they begin to think aloud, listen to others, question, justify and explore (Fisher, et al., 2020).

Discussions can be oral or written, structured or informal, and can be used to address any discipline, text or topic between students and their teachers or peers. When planning instruction, teachers should be mindful of the following:

- Appropriate student group size for the content of the discussion and complexity of the concepts, questions or texts discussed;
- Timing provided to ensure all students have equitable opportunities to share their thinking; and
- Content used within their classroom discussion routines and protocols.

Although many discussion groupings exist in the field today, author and researcher Wendy Ostroff (2020) argues that one of the best classroom arrangements to get students acclimated to discussion structures for the first time, is sitting in a circle so students can maintain eye contact. As teachers initially place members in a group, a go-around strategy to have each person weigh in on their thinking to a specific quote or question helps to practice equal participation and get members accustomed to sharing aloud (Ostroff, 2020). In addition to



quotes or questions, some teachers may choose a thinking prompt to provoke deeper thinking and spark dialogue through video clips, articles, cartoons, photographs, problems, artifacts, music or works of art. Thinking prompts engage students, help them make connections and provide background knowledge to deepen thinking (Knight, 2013). Because older students are typically able to attend to tasks for longer periods of time than younger students, no more than 30-40 minutes is recommended for students ages 9 or younger to engage in discussion with one hour being the maximum amount of time suggested for students over age 10. To better prepare students for engaging in discussion, Ostroff encourages teachers to break younger students into pairs and older students into small groups of 3-4 to prime them for larger, whole group discussions in the future (Ostroff, 2020).

Discussion is most effective when each person in the group has a designated job, and much like the conditions for effective learning environments, feels safe and empowered to contribute meaningful ideas. The discussion leader or facilitator is one role students may assume in discussion circles. Within such circles, the discussion leader rarely offers their interpretation of the text, problem, compelling, question, controversial issue, situation or phenomena, but rather the student summarizes others' ideas and brings the insights back to the discussion purpose, question or textual evidence. Ostroff offers this poignant analogy of building a snowman to demonstrate to students why jobs for all discussion participants are needed and valuable (p.18):

“First someone puts out a tightly packed snowball (question or idea about the text or problem). As a group, we roll it around a bit and let it gather more snow. If we roll it too much in one direction, it’s going to become like a flat wheel. We need to stop now and then, smooth it out, then roll it in another direction for a while (go against the grain of our own thinking). When it feels big enough, we leave the first snowball for the base and start another one for the middle. Likewise, we don’t need everyone to put out original ideas. Some members are going to be in charge of rolling or smoothing; some heavy lifters will pick up the middle snowball and connect it to the base-and so on.” (Ostroff, 2020).

Brain Research and the Need for Discussion

Traditional school formats for discussion have long been teacher-led where the amount of student talk time is dictated by the instructor and how much they mediate the conversation in allowing students to respond. However, this initiate-response-evaluation (IRE) format does little to promote effective discourse because students are not given opportunities to create their own understandings, and in turn, develop higher-level thinking skills. Unfortunately, this call and response approach makes up a large majority of today’s classrooms as some educators are too heavily focused on checking for understanding rather than creating the conditions



necessary for deep meaningful discussions. On the other hand, academic conversation, where academic vocabulary specific to an academic discipline is often incorporated, allows for engaged discourse where teaching, modeling and practice of essential speaking and listening skills are taught across the content areas (Hoffer, 2020). One example of this can be found in the Interdisciplinary Literacy Practices within *The Kentucky Academic Standards for Reading and Writing*, where learners are expected to:

- View literacy experiences as transactional, interdisciplinary and transformational (ILP #3);
- Utilize receptive and expressive language arts to better understand self, others and the world (ILP #4);
- Collaborate with others to create new meaning (ILP #6); and
- Apply high level cognitive processes to think deeply and critically about text (ILP #9).

These speaking and listening skills are an integral part of learning at every grade level and content area in supporting students as lifelong learners.

Discussion Purposes

To better understand why discussion is needed in classrooms, it is important to explore the many purposes that discussion can serve. Classroom discussions may be used to (Frazin & Wischow, 2020; Cunningham, 2020; Hoffer, 2020; Herman & Nilson, 2018):

- Analyze or argue;
- Build relationships;
- Encourage active listening;
- Motivate preparation or increase participation;
- Uncover our own bias, values or moral stance;
- Clarify, confirm, clear up or probe;
- Build oral language fluency or academic vocabulary;
- Explore ideas and deepen thinking;
- Prove or debunk a statement or position;
- Transfer knowledge to new contexts;
- Report on completed work or share results of student work;
- Formatively assess participation or where students are along a learning progression;
- Understand another person's perspective by shifting roles or mindsets; or
- Contemplate and weigh evidence.



Social-Emotional Benefits of Discussion

While all of the purposes for discussion listed above are important to developing a safe and collaborative classroom environment, discussion can address students' social-emotional needs as well by building healthy relationships among teachers, students and peers. As students develop relationships and begin to establish friendships, the brain produces serotonin, a hormone that stabilizes mood and brings about feelings of happiness and well-being. By introducing emotions into the learning process, neurotransmitters emerge and increase the likelihood that cognitive material will be easily stored and retrieved (Herman, et al., 2018).

The neurotransmitter dopamine is released in the brain when learning is fun, exciting and enjoyable. This “feel-good” chemical acts as an auto-save feature to make it easier for students to remember information. In addition, as students spend more time talking, they get to know each other better and build a stronger classroom community. This increased knowledge of their peers leads to feelings of empathy, which can positively shift how students interact and think within their classroom environment. Allowing students a small portion of time devoted to self-selected topics that matter most to them (even non-academic “small talk”), gives students a sense that their lives, interests and identities are being honored (Frazin & Wischow, 2020).

Small Talk, Big Impact

Educational research has provided considerable insight into what works when it comes to classroom discourse. When teachers effectively implement talk in classrooms, “small talk” is not time wasted. Given a small amount of time to talk about topics unrelated to the task at hand, research studies by Ariga and Lleras (2011) published in *Cognition* found that productivity increased. Even testing people's ability to stay on task within a 50-minute block of time proved to be more productive with a short break of talking as different stimuli can lead to maintained focus and persistence (Frazin & Wischow, 2020; McTighe & Willis, 2019).

Brain research also is clear on the value of peer discussions (i.e., a brief turn and talk) in avoiding fight-flight-freeze mode where students are anxious and uncertain about what to do and deep learning is impeded. To leverage the chemicals in our brain which maximize memory and focus, teachers set students up for success by allowing them to answer three primary questions during brief turn-and-talks: (1) What am I going to be learning? (2) What strategies will help me learn and (3) How will I be asked to show my learning? Allowing students a few minutes to answer these three questions can help to maximize focus and memory by providing students with a calm anticipation that ultimately saves time in checking in with struggling students who may be unsure of what to do (Benson, 2021).

Collaborative Classroom Conversations

Providing students with opportunities to engage in collaborative conversations is useful for oral language, social, academic and emotional development. English learners are able to engage in



conversations which intentionally encourage the ongoing use of academic vocabulary as they talk with classmates. These conversations are crucial in helping all students deepen and clarify their understanding of complex concepts and texts (Frey et al., 2013), and as learners have increased opportunities to discuss what they read, the higher their test scores and overall academic achievement (Hoffer, 2020; US DOE, 2013).

So how do educators begin to effectively establish discussion partnerships in their classrooms? Frazin & Wischow (2020) suggest five strategies to help build positive classroom relationships through talk:

1. Honor the talk that already occurs daily.
2. Acknowledge that “small talk” is huge in maintaining focus and establishing empathetic listening skills.
3. Build strong student partnerships by planning for and explicitly teaching in-depth discussion skills.
4. Help students get to know each other as learners and as people.
5. Use discussion to fuel your teaching. Knowing students' interests, strengths and needs goes a long way in finding ways to motivate individual students (p. 31-43).

By modeling the behaviors and strategies listed above, teachers build positive classroom relationships through talk that lay the foundation for explicit teaching of in-depth discussion skills later.

Explicit Teaching of In-Depth Discussion Skills

In a growing world where students continually hear quick media sound bites and capture their thinking in quick texts or “tweets,” fewer discussions are devoted to listening to complex issues and asking probing questions. Schools and districts are faced with an ethical obligation to prepare students for discussions in a civil society rich in diverse experiences, perspectives and needs. However, for students to be motivated to engage in meaty discussions, they must see the content of those discussions as relevant and worthy of their time. Discussions that focus on the “what” in the curriculum are often seen by students as less relevant, do not successfully help students understand the content and result in low student engagement. While some “what” questions are needed to lay a foundation for the context in discussions, the most impactful discussions center around the “why” or “how” (i.e., why a scientific principle is significant in our lives, how our emotions are strongly affected by music or why certain historical events happened as they did) (Tomlinson, 2020). Author Carol Ann Tomlinson (2020) outlines eight steps that educators can take to help students connect to the content and foster relevant, in-depth discussions:

- **Model empathy, respect, appreciation of diversity and an unfailing belief in all students.** This establishes a caring, affirming, secure classroom environment where high



expectations are present. Talking together teaches students diversity, how to treat others with kindness and how to listen and encourage one another (Knight, 2013).

- **Create a climate of mutual respect among all students by developing respectful relationships between the teacher and students.** Talking with and understanding the strengths and needs of individual students regularly and systematically sends the message, “We are stronger and better when we hear and draw on the talents, experiences and ideas each one of us brings to the classroom.”
- **Understand the key concepts, principles, ideas and essential questions around which each discipline is organized.** This helps teachers to link students’ experiences and interests to their growing knowledge of the discipline, so content feels relevant and meaningful to them.
- **Plan questions that will spark discussion and encourage students to contribute questions.** Intentionally planning for and building in questions throughout the instructional cycle sets the tone from the outset of a study. It also encourages the perspectives of students as they discuss issues worthy of consideration.
- **Model the attitudes and skills that contribute to rich discussions.** The teacher listens intently, uses wait time, looks for meaning in what students say, summarizes and builds new questions from previous responses/questions. This shows students they are valued, respected and the teacher believes in them and the contributions they bring to the learning process.
- **Prepare students for meaningful discussions systematically.** This includes:
 - Establishing norms for respectful conversations and group discussions;
 - Teaching and modeling how to support students’ ideas as they speak;
 - Providing dialogue opportunities in various groupings (pairs, small group, and whole class) before expecting students to lead whole group discussions;
 - Demonstrating how to challenge the ideas of others in a respectful way; and
 - Providing feedback to support students’ discussion skill development and steps for improvement.
- **Reflect on the quality and effectiveness of the discussions with students.** Students can assess how well they contributed to the discussion, offer feedback on the quality of the discussion and engage in giving feedback to others when appropriate.
- **Search out ways for students to be “drivers” of their own learning.** The end goal is for students to participate in group discussions without the teacher facilitating. Even more ideal is when students can successfully lead the discussion themselves as the teacher observes quietly (Tomlinson, 2020).

As teachers prepare students for meaningful discussions by explicitly teaching and modeling how to support students as they speak, Table 5.11 provides some suggested sentence stems



educators can use in classrooms based on their intended purpose. These stems are general in nature and can be adapted for use in any discipline.

Table 5.11. Sentence Stems for Discourse in Any Discipline

Purpose	Suggested Discourse Stems
What to say when we disagree...	<ul style="list-style-type: none"> • “That is a valid point, but I think...” • “I see things differently based on...” • “Then again, we shouldn’t forget...” • “I understand what you’re saying. Have you thought about...?”
What to say when we want to affirm others’ ideas...	<ul style="list-style-type: none"> • “My idea is related to _____’s idea...” • “I really liked _____’s idea about...” • What _____ said really resonates with me...” • “You made a great point about...” • “I hadn’t thought about that...” • “My idea builds on _____’s idea...” • “I’d like to piggyback off that idea...”
What to say when we express cause and effect...	<ul style="list-style-type: none"> • “The main cause was probably...because...” • “I think...led to...which led to...” • “I think...was caused by...because...” • “The effects of...were...which is evidenced by...”
What to say when we want clarification...	<ul style="list-style-type: none"> • “Can you elaborate on that?” • “In other words, are you saying...?” • “I have a question about...” • “I’m not quite clear about...” • “Can you explain...?” • “Do you mean that...?” • “Can you clarify _____ for me?”
What to say when we connect learning to other content areas...	<ul style="list-style-type: none"> • “This reminds me of (subject) when we were...” • “We also learned about...in (subject). Remember when we...” • “There was a strategy we used in (subject) when we were...That might help us think about...” • “This strategy works for both (subject) and (subject) because...” • “This is similar to what we do in (subject) when we...because...”

*Adapted from content in *Phenomenal Teaching* (Hoffer, 2020).

Engaging All Students in Discussion

Student-driven discussions often start with an essential question students are motivated to answer (i.e., How can we take action on teen vaping that makes a difference?) and use protocols that allow all students to engage in meaningful conversation and ownership. To foster student responsibility, increase individual student accountability and increase the quality of the discussions students engage in intellectually, researcher Diane Cunningham (2020) suggests educators consider three moves to help elevate student discussions:



Move #1: Teach students how to generate questions and respond. Students are able to effectively generate questions for discussion when they are 1) taught how divergent and convergent (thick and thin) questions are different, 2) provided teacher modeling and examples and 3) given ample time to practice generating questions with others. The divergent thinking that stems from asking divergent questions helps to promote student dialogue and increases creative problem solving (Otroff, 2020).

Table 5.12. Divergent and Convergent Questions with Examples

Divergent Questions	Convergent Questions
Allow for multiple correct or alternate responses	Call for a single correct response
Ask for opinions or conjectures with rationale	Are factual in nature and can be simple or complex
Can require evaluation, analysis and application	Involve remembering, explanations or comparing and contrasting
Divergent Examples	Convergent Examples
<ul style="list-style-type: none"> • What factors are most important to consider when purchasing a new home? • What is the best way to represent this algebraic equation? • What is the best approach to solving the problem of water pollution? 	<ul style="list-style-type: none"> • What is a decimal? • What are protons? • What support does the author provide for the claim she makes in the introductory paragraph? • What type of community do you live in?

Move #2: Have students describe what they would expect to see and hear in high-quality discussions. Simply asking students what they would expect to see in effective discussions does not get at the heart of discourse that includes deep thinking. In order to encourage high-quality discussions from students, they need to see and hear strong models in action. Sharing video clips of high-quality discussions helps students to observe others effectively (Cunningham, 2020):

- Making connections;
- Analyzing;
- Asking probing questions;
- Clarifying;
- Uncovering student assumptions;
- Identifying bias;
- Weighing evidence to draw conclusions; or
- Considering other alternatives or the perspectives of others (Cunningham, 2020).

Move #3: Encourage students to reflect, self-monitor and set goals. After students can identify the criteria for high-quality discussions, they need opportunities to practice and self-monitor the quality of their own discussions. The teacher may provide students with specific criteria to work on, or students may provide feedback to one another in pairs or small groups. Coupling



effective discussion criteria with reflection prompts helps students begin to think metacognitively and progress towards high-quality discussions. These reflection prompts can also be used as a lesson/unit wrap-up or formative assessment. Some discussion-focused reflection questions could include (Cunningham, 2020):

- What did your group do well today?
- What thinking skills challenged your group? Why do you think so?
- What part of the discussion process was difficult for you? Easy?
- What goal might your group set for your next discussion?
- What aspect of group discussions are most challenging for you? Why?
- How does sharing the thinking of others out loud help you to understand?
- What new questions did your group raise today?
- What might your group have done differently to improve today's discussion? Why do you think so?

Together, these three moves increase student engagement and ownership, build student efficacy and lead to lifelong thinking skills for all students (Cunningham, 2020).

Importance of Intentional Planning

As mentioned previously, an important step in closing the gap between research and effective classroom implementation is intentional planning on the part of the teacher. In order for educators to gain maximum benefit from evidence-based practices, they must be mindful of and purposeful in their planning. When explicitly teaching in-depth discussion skills, educators need to first think through and intentionally plan for those classroom interactions. As a starting point, teachers will want to plan lessons in terms of time and content around an important text theme, problem, compelling question, controversial issue, situation or phenomenon. For example, elementary teachers may decide to read a text aloud to younger students or review the key ideas before beginning discussions. Older students may need a discussion notebook or question journal to take notes on ideas that emerge as they are listening to others, while younger learners can do the same by drawing pictures of what they think about the text (Ostroff, 2020).

Considerations for Distance and Blended Learning Settings

In distance or blended learning settings, planning and communication are requisites when including discussion in synchronous sessions with students. A question of the day can be used for shared discussion and writing where parents lead the discussion, write what is dictated by their child and send a photo of the writing to the teacher. Teachers then check what has been shared with them to follow up with questions in online chats and begin brainstorming future discussion topics. Synchronous sessions (also known as live or concurrent sessions) with



students should **prioritize** the time for discussion, connection and interaction. As teachers plan lessons, they should be thinking about the learning experiences students need that will best prepare them for interactive, virtual discussions (i.e. equitable discussion protocols, written tasks, brief videos, or readings) (Fisher et al., 2020; Hammond, 2020).

Structures and Routines for Promoting Equitable Conversations

There is an old adage in education, “Whoever is doing the talking is doing the learning.” While research from the *U.S. Department of Education* (2013) indicates students with higher achievement scores have engaged in meaningful discourse more often, historically marginalized students (e.g., introverted students, students with disabilities, English learners and students of color) are not typically leveraged in classroom discussions and need talk structures to confidently share and have their voices heard. Discussion strategies such as *turn-and-talks* or *think-pair-shares*, while useful, do not always help facilitate deep thinking or what some experts in the field refer to as “cognitive chewing.” These protocols offer a structure or process, so all participants take turns discussing, speaking and listening.

While the overly structured nature of protocols may seem stifling to free-flowing discussion, the opposite is in fact true. Because most protocols are timed, all students, including those students typically left out of conversations, are given opportunities to contribute. English-speaking, extroverted students with mainstream background knowledge are no longer able to dominate classroom discussions where discourse protocols are the norm (Hammond, 2020).

Structured protocols can promote equitable participation, increase individual student accountability and help create more culturally responsive discussions (Hammond, 2020), but learning how to spark rich student conversations can sometimes be a difficult art for educators (Hoffer, 2020). **While some students are naturally lovers of talk, most students benefit from structures and protocols to help ideas surface and to promote fertile thinking.** When selecting a protocol, Hoffer (2020) suggests three crucial factors for consideration: (1) **Groupings** - What size grouping will be best based on my purpose? (pairs, triads, whole class, etc.) Paired discussion groupings can help raise the level of individual student accountability and engagement rate in the classroom as a whole since all students are participating at once; however, teachers will need to decide which grouping best matches their purpose and learning outcome for a given lesson. (2) **Timing** - How long will discussions last? (one lesson, several days of lessons, etc.) Meatier discussions on complex or controversial topics may need to carry over into multiple lessons for students to inquire and fully express their thinking. (3) **Content** - What structures will be most successful to support students as they grapple with understanding? (Hoffer, 2020).

While there are many discussion protocols commonly used across the field of education, not all protocols provide the structures for equal participation or for all students to share their



thinking with cultural responsiveness in mind. Teachers should consider selecting talk structures and tools that: (1) honor the ethnic, racial, and linguistic background knowledge individual students bring to the discussion; (2) provide marginalized students with increased access to discussion flow; (3) allow students agency in leading the conversation; and 4) leverage everyday communication modes to give students a strong cognitive workout. Careful selection of structures with these criteria in mind will ensure that:

- Students feel socially and emotionally safe to share in classroom conversations in the future;
- Teachers are responsive to students’ interests and knowledge base; and
- Students feel empowered and equipped to be facilitators of their own learning conversations.

When choosing a discussion protocol for classroom instruction, teachers should first consider the intended purpose. Various discussion formats have a place in classrooms at differing times and some formats work better than others depending on the intended learning goal or purpose (Novak & Slattery, 2017). Table 5.13 below provides a few examples of protocols teachers could incorporate in their classrooms to increase accessibility and engagement for all students:

Table 5.13. *Equitable Protocols for Use in Any Discipline*

Discussion Protocol	Purpose	Description
Dyads	Provides a social emotional grounding to the beginning of the day or class period	Dyads are a listening and talking exchange structure in which each speaker is listened to for a designated amount of time without interruption.
Tea Party	Used with quotes and images that help students curate information	Tea Party is a movement structure in which participants select a quote or image and share how it connects to their work or a specific text by mingling with pairs or triads around the room.
Tuning Protocol	Helps students revise and improve work in preparation for whole or larger group discussions	Tuning Protocols are a collaborative reflection structure where student work is shared and examined; collecting feedback to improve student outcomes in the classroom.
Text Rendering Strategy	Allows students to activate background knowledge, explore new ideas and make connections using grade level texts	The text rendering strategy is an information processing strategy where participants respond to a text using a predetermined set of symbols established by the facilitator.
Kiva	Helps teachers to formatively assess which students can make text-based connections, take the conversation deeper or identify	In Kiva, four students are seated in a center square with four additional students seated behind them (representing the spokes of a wheel). The four students in the center square begin the discussion topic/questions. After a period of time, the teacher



	real-life connections to academic concepts	cues students from behind to move into the square and take the discussion deeper, building on what has been said. New students move into the “wheel spoke” seats and the cycle repeats.
Graffiti Tag Billboard	Stimulates thinking before or after a conversation by leveraging students’ preference towards multimodal expression	Students use doodles, collage, written words, sketch noting or other visual forms of expression to “tag” the “billboard” much like a Chalk Talk where students circulate the room adding on to the thinking or ideas of others already posted. Where Chalk Talks are traditionally in written narrative form, Graffiti Tag Billboards allow for visual or tactile representations.
Talking Chips	Used to promote equal participation within a group or avoid one student from dominating the conversation	Each student is given an equal quantity of chips. When a student wishes to speak they place a chip on the table. No one is allowed to speak unless their chip is on the table. Once a student uses all of his or her chips to speak, their only option is to be a listener in the group (Novak & Slattery, 2017; Hoffer, 2020; Hammond, 2020).

Discussion Strategies to Support Formative Assessment

Evidence of student learning is a key component of the formative assessment process because it informs student and teacher decisions about next steps to move students toward their learning goals. This starts with eliciting meaningful evidence that can be used to interpret student learning and inform next steps. Because meaningful evidence is elicited primarily through formative assessment, educators must be deliberate in selecting an assessment type that matches their intended grain size and purpose. Within the context of classroom discussion, both performance and ipsative assessments are often used to measure student participation, engagement, communication skills and understanding of the content being discussed.

Performance Assessment

Not all assessments require the traditional pencil and paper tests many educators grew up with in their own schools. Many of the discussion strategies found in today’s classrooms allow students to apply more interdisciplinary concepts and skills through performance assessments. Performance assessments require students to pull from content, skills and concepts that are difficult to replicate through paper-pencil assessments. When teachers embed discussion as a means to assess student understanding in their classrooms, students are more likely to see that what they are learning is relevant, demonstrate transfer of their learning to new tasks and be more motivated to continue learning at deeper levels. While there are many performance assessment strategies available for teachers to choose from, debates and Socratic seminars are two strategies that feature discussion and can be utilized in face-to-face, remote and hybrid learning environments (Fisher, Frey, Bustamante, & Hattie, 2021).



Debates

According to Hattie’s research, formal discussions, such as debates and Socratic seminars, have an effect size of 0.82 and have a strong potential for accelerating student learning. Intentionally planned out debates challenge students to consider controversial topic nuances, use formal reasoning and formulate arguments. Debate strategies can stimulate student interest and intrigue using friendly controversy (Marzano, 2017). While debates in the distance learning classroom can be synchronous or asynchronous, it is important for teachers to ensure protocols and procedures in the synchronous or face-to-face setting are explicitly modeled, practiced and understood by all learners. Debate performance should be based on success criteria and can be co-constructed with students. Giving students time to craft arguments for both sides of the debate helps to increase student engagement and responsibility while ensuring students effectively generate evidence of learning (Fisher et al., 2021).

Socratic Seminar

Another formal discussion strategy is the Socratic seminar. A Socratic seminar is a fishbowl structure in which a small group of students discuss a predetermined topic while the remaining students observe and take notes. The inner circle of students discusses the topic (the fishbowl) and asks/answers questions while students in the outer circle are listeners. Within the seminar, the facilitator asks open-ended questions based on a text or problem while students listen closely to the participants’ conversations to think critically for themselves and synthesize their own understandings. After a round of discussion, students in the outer circle trade places and roles with students in the inner circle as the discussion continues. Through this structured discussion, students learn to pose questions and civilly add on to the thinking of others. Teachers may find it helpful to use a reflection or single-point rubric based on co-constructed success criteria to assess student learning. If teachers choose to engage students in a reflective assessment of the seminar, the assessment should be based on pre-established learning goals and success criteria and consider the following questions:

- To what degree did the text or problem dominate the discussion?
- Which students individually participated in the conversation? Which students did not?
- To what extent did students grow in their understanding of the topic? (Fisher et al., 2021).

Ipsative Assessment

No matter the type of assessment, observable evidence of what students know and can do in relation to the learning expectations are the basis for high quality assessment practices. While not a widespread term used in today’s classrooms, *ipsative assessments* compare students’ present performance to past performance. Often this is measured in pre- and post-assessment data; however, when considering discussion assessment strategies, goal-setting conferences



and video diaries often emerge as they easily measure change over time. While formative assessment practices encourage teachers to make adjustments in their classroom instructional practices through ongoing checks for student understanding, students are able to use the data collected from ipsative assessments to inform their learning practices as well. When teachers intentionally build in time for individual student reflection and feedback, ipsative assessments help students to:

- set goals for themselves;
- make adjustments to the strategies they employ or questions they ask in the classroom; and
- gain deeper insight into their personal progress and areas of needed growth (Fisher et al., 2021).

Goal-Setting Conferences

Following a period of remote and hybrid learning where potential student learning loss may exist, there is often a need for acceleration techniques to bridge student learning gaps. Learning goals alone aren't enough; there needs to be intentional planning and structured time to go with them. With an effect size of 0.51, clear goal intentions have the potential to accelerate student learning when student motivation and ownership are key considerations. Because clear learning goals are a critical component of effective student-teacher goal setting, conferences can be a beneficial ipsative assessment strategy as teachers and students record the progress being made towards reaching those goals at regular intervals using tools such as tables, graphs and anecdotal notes. When teachers provide clear and specific feedback to students linked to their personal learning goals, students accelerate more quickly toward reaching the intended learning outcomes. Goal-setting conferences are powerful in motivating students to move closer to the intended learning outcomes when the embedded goals:

- Build competence;
- Provide choice and autonomy;
- Align with students' interests; and
- Change the perception of themselves.

Teachers should steer students away from performance goals such as, *"I want to get all 4s on my lab assignments."* and encourage students to establish goals connected to mastery of personal learning goals such as, *"I want to promote deeper thinking with the types of questions I ask my classmates during discussions."* Both content and personal learning goals can be discussed together during goal-setting conferences. Goal-setting conferences provide time for emotional check-ins, build teacher-student relationships and help students set short- and long-term goals to visualize where they are along a learning progression (Fisher et al., 2021 p. 86).



Video Diaries

Student and teacher capacity for using digital platforms has grown as distance and blended learning platforms have become commonplace in Kentucky schools. Video diaries are one such digital platform students (and teachers) can use to create and revisit throughout the school year. Students are able to watch previous video entries and reflect on changes they see in themselves while noting concepts that remained the same. Teachers are able to use video diaries to capture and observe cognitive growth in student understanding over time. Video diaries help teachers learn about their students as individuals while documenting the misconceptions, progress and understandings of their students. These visual records are invaluable evidence to share at parent-teacher conferences or to celebrate student growth (Fisher et al., 2021). For additional guidance on the formative assessment process in supporting classroom discussion visit the Eliciting Evidence of Student Learning section of the [Model Curriculum Framework](#).

Sources for Discussion Protocols

Below is a list of possible discussion protocol resources educators may use to help students process their learning and begin to think deeply about content. These protocols may be used to elicit discussion before, during or after instruction. Teachers do not have to use all of the discussion protocols listed below but should choose those that best meet the needs of their students.

- EL Education Classroom Protocols: https://curriculum.ededucation.org/sites/default/files/curriculumtools_classroomprotocols_053017.pdf
- National School Reform Faculty: <https://nsrfharmony.org/protocols/>
- School Reform Initiative: <https://www.schoolreforminitiative.org>
- Teaching and Learning Lab at Harvard Graduate School of Education: https://www.gse.harvard.edu/sites/default/files/Protocols_Handout.pdf
- Visible Thinking Routines: http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03c_CoreRoutines.html



Evidence-Based Instructional Practice # 5: Questioning

Introduction

Creating a culture that supports students in meeting intended learning outcomes within the *Kentucky Academic Standards (KAS)* is critical to establishing equitable learning environments for all students and is often reflected in the approach teachers and students use. Questions serve as a barometer for the level of thinking occurring within the learning community of a classroom. Visible Learning's *Meta^X Influence Glossary* (Corwin) defines questioning as a "practice by which an instructor or textbook writer poses factual or conceptual questions to students," noting it, "dates to Greek antiquity, if not earlier." Part of questioning's power as an educational practice is its flexibility. Questions can be taken up in written text, through research or discussion, and one question may generate others as students question texts, peers or solutions (Hoffer, 2020).

According to John Hattie's research (2015), questioning has an effect size of 0.48 and has the potential, being above the hinge point of .40, to increase student achievement by over one year's growth in one year's time (Hattie, 2015; Fisher, et al., 2016). Questioning also informs other high-effect strategies such as inquiry-based teaching (.40), inductive teaching (.44) and classroom discussion (.82), as well as being an essential element of critical thinking more generally. To establish critical thinking practices in classrooms, author Rebecca Stobaugh suggests teachers pose open-ended (divergent) questions that challenge students to think creatively and provide opportunities to practice asking, discussing and responding to those questions (Stobaugh, 2019).

Purposes of Questioning

Questions can provide new realizations by unlocking the unknown. Effective teachers are able to ignite curiosity and excitement through the thoughtful way in which they pose questions (Marshall, 2019). The questions teachers ask students, however, are more important than the answers they seek because rigorous and thoughtfully planned questions engage students, help them demonstrate depth of thinking, challenge their claims, assist them in drawing conclusions and assess students' current or prior knowledge. In addition to the benefits mentioned above, student generated questions can be used for the purposes of:

- Reviewing content;
- Fostering divergent and innovative thinking;
- Elaborating on information;
- Setting the purpose for listening or viewing content;
- Showing gaps in student comprehension;
- Making predictions;



- Challenging or wondering about the choices others make;
- Generating thinking before, during or after reading;
- Prompting thinking about a text’s content, structure or language;
- Providing an area of focus for planning, instruction or research;
- Clarifying information that may be misunderstood or missing;
- Assisting teachers in guiding classroom discussion and close reading analysis; and
- Demonstrating that all students’ ideas are valued and supported (Marzano, 2017; Miller, 2020; Fisher, et al., 2016; Frazin & Wischow, 2020; Hoffer, 2020).

Author Martin Renton argues teachers clearly knowing the purpose behind questions they pose to students is the single most important factor in improving their classroom questioning practices (Renton, 2020). Checking for student understanding, while important, should not become the sole intent for asking questions of students. By knowing the purpose of their questioning, teachers identify the level of thinking they want their students to engage in and can plan for that same level of thinking. As teachers consider the questioning sequences they plan to use in their classrooms, Renton identifies five frames that act as guidance in planning questioning that moves students closer towards their intended learning goals:

1. **Knowledge** - A form of closed questioning used to gauge a student’s ability to remember basic facts or information and scaffold new, more complex learning;
2. **Understanding** - A form of conceptual questioning where students can demonstrate how separate facts are connected;
3. **Skills** - Focuses on what students will be able to do and how they will be working; it is about learning “how” rather than learning “what” (research skills, for example);
4. **Attitudes** - Focuses on helping students to be open-minded (through open-ended questions) and develop positive speaking, thinking and listening behaviors;
5. **High Expectations** - The questioning language, structures and protocols used in a classroom sets a culture of expectation. Teachers who use higher level questioning will produce students who engage in higher order questioning; they come to predict and internalize the language they hear every day (Renton, 2020).

Consumers and Producers of Questions

Questioning accounts for over 60 percent of a teacher’s classroom talk and less than 1 percent of talk for students (Walsh, 2021). Traditionally, many schools have taught students to be *consumers* of questions rather than *producers* of them because much of students’ schooling has been about answering questions posed by teachers: multiple-choice questions, short-answer questions, essays and oral questions before, during and after instruction (Nobis, Schulze, & Miller, 2019).



While questioning does much to check for student understanding, *asking* questions of students is not enough. Educators should explicitly teach students how to generate questions for themselves, in accordance with the KAS and so they are also better equipped to be critical consumers of information who can support claims using credible evidence, a real-world skill needed in our democratic society (Miller, 2020).

Research Supports the Need for Questioning

Research suggests preschoolers ask around 100 questions per day. By fifth grade, students average 0-2 questions per day (Engel, 2011; Stobaugh, 2017). That rate drops dramatically by the time students reach middle school, perhaps because students grow more self-conscious about speaking out or being perceived as wrong in front of their peers as they get older. However, questioning helps to get students talking to explore, play and indulge their curiosities (Frazin & Wischow, 2020).

When learners are challenged, most readers will ask questions to attempt to make meaning from difficult texts, problems or phenomena (Hoffer, 2020). Classroom discussions provide the structured time for students to feel safe and affirmed in posing those questions (For the research basis behind classroom discussion see the section in Evidence-Based Instructional Practice #4 titled “Brain Research and the Need for Discussion). While discussion is crucial to comprehension and critical thinking, observations in secondary English classes found that the average length of whole class discussions were between 14 and 52 seconds per class period - not enough time to really deepen student knowledge. Because effective teacher and student questioning fosters quality classroom talk, it is imperative that teachers use questioning to frame whole and small class discussions and deepen student understanding (Fisher, et al., 2016).

Since students’ questioning skills develop as they read and engage in classroom discussions, teachers should consider generating questions during tasks rather than waiting until after they have read text or finished discussion. Questions generated during these instructional tasks help students to clarify a speaker’s points, affirm their initial thinking, remember what was read or discussed, deepen their understanding of key concepts and better see others’ perspectives (Novak & Slattery, 2017).

Importance of Intentional Planning

According to research by Novak & Slattery (2017) Teacher preparation of questions ahead of time often leads to more rigorous questions than those generated “on-the-fly.” Therefore, when planning day-to-day learning experiences, classroom discussions or assessments, it is important for teachers to reflect on the following questions:



- What is the intended purpose of this lesson/unit, assessment or discussion? Which question type or sequence is best suited to align to this purpose?
- Where might I intentionally embed opportunities to engage all learners in these questions? Have I given consideration for reluctant learners or historically marginalized students (students of color, English Language Learners, low-income students, introverts, etc.) to participate?
- Do the questions I have planned match the intended depth and rigor within the KAS?
- Where might I “raise the rigor” of my questions to challenge students to think more deeply using higher-order questioning?
- Have I provided opportunities to model questioning for students through think-alouds or think-alongs? Where might I incorporate modeling of metacognitive or self-questions to empower my students as questioners?

Questioning for Surface, Deep and Transfer Learning

All question types have a necessary role in the classroom and may be used at various times and in various sequences to optimize student understanding (See table 6.1). By understanding the intended purpose of *why* they are asking questions, and the depth of thinking needed at various points *within* their lessons, teachers are better equipped to move student thinking from surface to deeper levels. Moving thinking to deeper levels increases the likelihood that students will retain information and knowledge will be transferred to future learning contexts (Stanley, 2020).

Surface Level Questions

Convergent (or closed questions as they are sometimes referred) are often used when one clear, logical answer is required. These types of questions are more surface level in nature and often require a yes or no response. **Text-dependent questions also may be surface level when the information is explicitly stated in the text because they can be answered from textual facts, evidence or recall (often called “right there” questions).** Surface level questions may emerge as students process and reflect metacognitively by using learning goals and success criteria to self-assess what they still “need to know” to move towards their learning outcomes (Walsh, 2021).

Moving to Deeper Learning

Students begin to move from **surface to deeper** learning as they ask questions to understand causal relationships (how one person or event may have caused another) or as they evaluate a person, event or thing’s importance (i.e., *How will understanding ____ help me?* or *How might I evaluate ____?*) **Text-dependent questions systematically help to deepen students’ textual understanding and enrich classroom discussion when used in conjunction with close reading.** Close readings using text-dependent questions should be conducted in any class where complex texts are used, not just in reading and English/language arts classes. Teachers can



intentionally plan dependent questions that focus (an inferential sequence used during discussion to foster deep learning) or funnel (sequencing strategy used during surface learning periods to intentionally send students down a cognitive path) depending on the intended lesson purpose. These four phases of text-dependent questions include:

1. **Literal** - What the text says; can be answered using recall or facts;
2. **Structural** - How the text works;
3. **Inferential** - What the text means; not explicitly stated and typically open-ended; and
4. **Interpretive** - What the text inspires one to do or think (Fisher, et al., 2016; Stanley, 2020).

Text-dependent questions require students to rely on evidence from the text rather than just their own personal experiences and can relate to (1) general understandings, (2) key details, (3) vocabulary and text structure, (4) the author's purpose, inferences, or intertextual connections, or (5) opinions and arguments. Some sample text dependent questions include:

- Why would the author select this title for the chapter? (general understandings)
- What two events in this text led to the individuals seeking a solution to their problem? (key details)
- Why do you think the character/individual chose to...? (inferences)
- How does the chronological order of events help the reader to better understand the overall purpose of the text? (vocabulary and text structure)
- Compare text to text. What are the similarities and differences? How do the similarities and differences impact meaning within each text? (intertextual connections)
- How effective are the author's claims in the text? Is the evidence relevant and sufficient to support the overall argument? (argument)
- How does the author's perspective in telling his/her story influence how we perceive the characters? (author's purpose) (Frey & Fisher, 2013)

Transfer Questions

Transfer questions ignite exploration and inquiry and are often used when students wonder how something may be applied to a real-world problem or to consider what might happen if one variable of a rule, principle or concept were changed (e.g., *Could we use this for ____?* or *What if we changed ____ to ____?* *Would we be able to ____?*). These questions are more often open-ended or divergent in nature as students are asked to use their creativity and critical thinking to create, justify, defend, judge, predict, imagine, hypothesize or evaluate. Transfer questions move students into higher-order thinking and motivate them to self-question in new and unique learning situations (Walsh, 2021). For a more in-depth description of self-questions, see the section below on Metacognition and Self-Questioning.



Table 5.14. *Types of Questions and Questioning Sequences Teachers Would Ask*

Question Type	Purpose	Examples
Convergent (Closed)	Typically surface learning where one clear, logical answer is required; Students may be asked to name, define, identify or respond with “yes” or “no” answers.	<ul style="list-style-type: none"> • What is the capital of Kentucky? • Who is the author of that book?
Divergent (Open or open-ended)	Typically used for deeper learning where multiple answers are possible or students are encouraged to use their imagination and/or creativity; Students may be asked to create, justify, defend, judge, predict, imagine, hypothesize or evaluate.	<ul style="list-style-type: none"> • How might this (insert chapter/event/experiment/problem) have been different if _____ had happened? • What was the most important invention of the 20th century? Why?
Text Dependent	Can be used for surface or deeper learning during close reading and/or classroom discussion. Text-dependent questions encourage students to utilize textual evidence and can be convergent or divergent.	<ul style="list-style-type: none"> • What words and phrases does the author repeat, and how does it impact the tone of the text? • What can you infer about _____, and what is your evidence?
Self-Questions	Can be cognitive (meaning making) or metacognitive (used to self-monitor) and usually broken down into three categories: academic, dialogic, and exploratory depending on the purpose for asking (to understand, to see another viewpoint, or to explore).	<ul style="list-style-type: none"> • Can you tell me more about _____? (academic) • How might we think about _____ in another way? (dialogic) • What might be an alternative to _____? (exploratory)
Question Sequence Type	Purpose	Examples
Focusing	A sequencing strategy used during discussion to foster deeper learning; Helps students understand inferential and structural elements of their reading in any discipline.	<ul style="list-style-type: none"> • How did the setting influence the story? • Why do you believe the author chose the word/phrase _____ in this passage?
Funneling	A sequencing strategy used during surface learning periods to intentionally send students down a cognitive path with an end in mind; Frequently used by teachers	<ul style="list-style-type: none"> • What is (<i>mathematical equation</i>)? How did you solve it? Could you have solved it another way?



	with new or complex content or information when students are initially grappling with understanding.	<ul style="list-style-type: none"> • What were the major events of the American Revolution? How did these events impact diverse groups?
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*Adapted from content in *Visible Learning for Literacy: Implementing the Practices That Work Best to Accelerate Student Learning* and *Challenging Learning Through Questioning* (Fisher, et al., 2016; Renton, 2020)

Foundational Question Starters

Being able to categorize questions by type and level helps teachers have a better awareness of the cognitive rigor taking place in their classrooms. By identifying the types of questions, they are asking in their classrooms, teachers are better equipped to reflect upon and improve their questioning practices. One fundamental way to raise the level of questioning is by using what Stanley refers to as the “Five Ws (and one H)” - Who? What? When? Where? Why? and How? These six form the basis for most questions asked of students and can typically be divided into lower and higher levels. Why and how questions take students beyond the literal questions found “right there” in the text to more inferential questions where students are asked to judge, evaluate, or interpret evidence. See Table 5.15 below (Stanley, 2020).

Table 5.15. *Six Foundational Question Starters*

Typical Level of Questioning	Question Stem Starters
Lower Level	<ul style="list-style-type: none"> • Who? • What? • When? • Where?
Higher Level	<ul style="list-style-type: none"> • Why? • How?

*Adapted from content in *Promoting Rigor Through Higher Level Questioning* (Stanley, 2020).

Aligning Questions to the Intended Depth and Rigor of the Standards

Teachers often rely on questioning to ensure students have mastered standards, whether it is through questions asked aloud, assessment questions, in conjunction with performance tasks or during classroom discourse. Asking questions to address content within the standards is important but asking questions at the depth and rigor intended by the standards writers is equally important to assure equitable learning for all Kentucky students. Further, *KAS* documents require teachers and students engage with learning experiences designed around asking questions, and students’ skill in formulating disciplinary questions is a component of those experiences.



Identifying the intended depth and rigor of standards and the potential place of questioning within them, therefore, should be the starting point to developing effective questions. In order to support educators, the KDE has developed the Breaking Down a Standard resources. The purpose of the protocol is to guide teachers through a process for utilizing the components within the KAS documents to gain greater clarity in what the standards require students to know and be able to do in order to meet grade-level expectations. [Breaking Down a Standard resources](#) are available for reading and writing, mathematics, science and social studies.

Once educators have identified the appropriate depth and rigor of a standard, resources can aid in crafting questions which effectively assess student mastery. The verbs of Bloom’s Taxonomy could be one such resource, and the levels of cognition they indicate can help direct questions to the levels of thinking present in a standard. Table 5.16 below contains examples of cognitive verbs associated with each of Bloom’s levels.

Table 5.16. Action Verbs Associated with Bloom’s Taxonomy

Bloom’s Taxonomy Cognitive Level (Lowest to highest)	Sample Verbs Associated with This Level*
Remember	Identify, recall, describe, name, select, list, define, tell, reproduce, locate
Understand	Infer, compare, explain, interpret, classify, exemplify, summarize, illustrate, give examples of outline
Apply	Apply, model, solve, examine, produce, modify, predict, complete, illustrate, translate
Analyze	Relate, assume, correlate, prioritize, explore, relate, differentiate, conclude, simplify, compare and contrast, transform
Evaluate	Choose, argue, debate, critique, evaluate, prove, support, rate, assess, recommend
Create	Write, revise, design, invent, produce, build, improve, plan, substitute

*Note: Not a comprehensive list

Teachers should match the intended depth and rigor of the standards in designing questions for their students as outlined above so students are meeting grade-level expectations. Just because a standard is written at a specific cognitive level, however, does not mean teachers should always stop at that level in designing questions. In order to provide rigorous opportunities for students to construct understanding, teachers can challenge students beyond minimum expectations by taking a more surface-level standard, one that may occur earlier in a learning



progression, and deepen thinking and the learning students are able to demonstrate with a higher-level question. Rather than only asking students to *know* and to *understand*, proceeding to shift them into *evaluating* or *creating* raises the level of rigor as they become able then to transfer and to apply what they have learned (Stanley, 2020).

Engaging All Students in Deeper Thinking Through Questioning

Questioning demonstrates students have an intrinsic motivation to learn more and to understand (Stobaugh, 2017). When students ask questions in the classroom, they are engaging in higher-level thinking; however, only 58% of students say they feel comfortable asking questions in their classrooms (Fisher, et al., 2018). The questions asked in classrooms reflect the thinking and learning that is occurring, but *who* is most frequently being asked questions in classrooms is also indicative of which students are doing the deeper learning (Ritchhart & Church, 2020). Asking multiple types of questions helps to engage more students in whole class discussions, deepens students learning and makes learning visible; it is imperative, therefore, teachers ask questions that will engage **all** students represented in their classrooms, including students who have been historically marginalized (Stobaugh, 2017; Marzano, 2017).

Asking Questions of Reluctant Learners

Teachers will sometimes avoid asking in-depth or complex questions of learners who struggle most because they want to avoid embarrassing them if they answer incorrectly or don't know what to say. However, this behavior sends an implicit message to students that they are not expected to do well. Robert Marzano suggests the following **considerations when asking in-depth questions of reluctant learners**:

- Provide equitable opportunities for all students to respond to questions.
- When students struggle to answer questions, teachers can restate the question, allow students to collaborate or “phone a friend”, or provide hints and clues.
- Thank all students who provide a question or response even if it is incorrect. This validates the thinking of all students and encourages future participation.
- Allow students to “opt-out” of answering until they have had more thinking time to process.
- Pause and provide adequate wait (think) time after asking questions so students have time to process information and formulate their response.
- Avoid calling only on students with their hands raised. Using a class roster to check off students or a jar of popsicle sticks labeled with each student's name will help to ensure all students have equal opportunities to respond.
- Encourage and model responding to incorrect responses in a positive manner (Marzano, 2017).



Empowering Students as Questioners

Student questions are a powerful lever for learning; they should be utilized by both students and teachers. While questioning acts as an authentic feedback tool for teachers to assess where student learning is along a standards-based progression, empowering students as questioners helps to accelerate learning and level the playing field for all learners, particularly underachieving students. According to author and researcher Jackie Walsh (2021), equipping learners as questioners provides multiple benefits for students including:

- Increasing motivation and ownership;
- Improving student performance on academic outcomes;
- Supporting students in self-regulation, reflection and monitoring;
- Increasing preparedness for college and their future workforce; and
- Improving students' abilities to assume civic responsibilities necessary for life in a democratic society (Walsh, 2021).

Knowing the benefits listed above are critical for citizens of any age, teaching students how to ask themselves questions, generate questions for others and effectively respond to questions becomes a moral imperative for today's educators.

Wait Time vs. Think Time

Several decades of classroom research consistently indicate a lack of student questioning across all grade levels and disciplines. Research from the 1970s until now points to classrooms where less than five percent of the questions asked in classrooms are from students. So why are so few students asking questions? While many students do not feel safe to take risks and ask questions in classrooms where community-building has not been a priority, the rapid pacing in most classrooms is often the culprit. In classrooms where students were engaged in asking questions of themselves and their peers, consistent use of wait time was present (Rowe, 1972; Dillon, 1988; Walsh, 2021).

Research by Mary Budd Rowe suggests that waiting at least three seconds before accepting a response from students improves the quality of questions students ask (Renton, 2020). Students get too little time to process information, ideas and language in today's classrooms to contribute to meaningful dialogue. This often leads to student disengagement and conversations being overrun primarily by louder, more confident, English-speaking students. Students often viewed as less able to contribute to classroom conversations by their teachers are often not waiting passively; they are spending that time thinking. Hence, more recent language in the field has shifted from "wait time" to "think time." When given more think time, students often viewed as less able to contribute to discussion outperform those teachers perceive as higher ability (Stahl, 1994; Renton, 2020).



Teachers ask on average 400 questions a day of their students; more questions, however, do not equate to improvements in students' learning or thinking. While improving the quality of questions teachers ask is critical to increasing classroom rigor, what often becomes a roadblock to student thinking is the amount of wait time allowed for students to respond. The average student is only allowed 0.8 seconds of "think time" before teachers accept a response. Having under one second to respond often leads to fewer student attempts to answer and less participation in classroom discussion. A three second minimum is recommended *before* accepting a response from students with an additional three seconds recommended *after* the response is shared. Allowing additional wait time increases the number of questions students ask, decreases the number of students who do not respond at all, encourages voluntary questioning and helps to provide an equitable learning environment for all students (Marzano & Simms, 2014; Renton, 2020).

Metacognition and Self-Questioning

Metacognition is defined as the ability to observe our own thinking. It helps students to monitor their learning and to **self-regulate** (adjust an instructional strategy or approach based on self-observation or feedback) by having greater consciousness of themselves and an understanding of the tasks and of the strategies needed to complete them. Students need explicit instruction and modeling in how to become metacognitively aware. How many times have adults been reading and gotten to the bottom of the page only to realize they have no recollection of what they just read? When this happens, adults will often go back and reread or ask questions automatically in their head (i.e., What just happened? Does what I just read make sense?). Students need to be taught how to pause and generate their own questions periodically throughout a text using the strategy of self-questioning; many do not inherently know how to question themselves as they read. By teaching students to self-question, educators give them the tools they need to monitor their comprehension and regain understanding. Teachers can model self-questioning for students using think-alouds or think-alongs (For additional information on think-alouds or think-alongs see [Evidence-Based Instructional Practice #3 on Explicit Teaching and Modeling](#) in the [Model Curriculum Framework](#)) (Fisher, et al., 2016; Walsh, 2021).

Types of Self-Questioning

There are three general types of self-questions students often ask: academic, dialogic and exploratory. Self-questions can be metacognitive or cognitive. When students ask themselves **metacognitive questions**, they are doing so to self-monitor thinking and learning. **Cognitive self-questions** help students make meaning of what they are hearing or reading and assist learners as they problem solve to think through tasks. **Academic questions** use discipline-specific language and assist students in developing deeper content understandings which move them closer to their intended learning outcomes. **Dialogic questions** help students to



understand another person’s perspective or thinking. The third type, **exploratory questions**, stem solely from a student’s natural curiosity and motivation to learn more or spark their own creativity (Walsh, 2021).

The comprehension strategy of questioning helps students predict and anticipate what might happen next in a text, solve problems and clarify textual information, but it can also prove valuable in teaching students relevant real-life skills as they investigate and research topics across disciplines (Frey & Fisher, 2013). Teaching students to continually self-question source accuracy and credibility is helpful as students engage in research and investigation. Teachers may want to consider posing the following model questions for students: 1) Does this site contain accurate information? 2) Is the hosting institution identified on the site? 3) When was the site last updated? Is it current information? 4) Are any included links to other sites of similar quality? Teaching students to consider these four questions will help them to critically analyze and evaluate Internet sources and bridge self-questioning habits students will use when confronted with new information in the future (Fisher, et al., 2016).

Tips and Protocols for Explicit Teaching of Self-Questioning

Education researchers Doug Fisher and Nancy Frey (2013) suggest teachers consider the following five tips for explicitly teaching self-questioning:

- Teach students how to break their reading into manageable chunks to maintain understanding.
- Encourage students to use headings and subheadings as stopping points to stop and self-question.
- Allow students to chunk information for themselves when texts do not contain headings and subheadings. Students can record questions they have in a notebook.
- Conference with individual students to check in on their self-questioning. See if students can answer the questions they generate.
- Allow time for students to practice questioning with teacher reinforcement and feedback.

Table 5.17 below offers some suggested protocols teachers can use to support students as they practice metacognitive strategies and learn to self-question.

Table 5.17. *Sample Questioning Protocols to Support Self-Questioning*

Questioning Protocol	Description
Question Everyone	Teachers tell students they will be calling on them randomly or by picking the student who looks least interested. Teachers may draw names from a bag or draw popsicle sticks with a student’s name on it to select a random student to respond.



	Students are encouraged to respond whenever they are called upon by the teacher (Knight, 2013).
10 by 10	Students work in small groups or individually to generate ten questions about a given subject, text, or topic. As a group they select their best questions for use in a whole-group discussion (Stobaugh, 2019).
Think-Pair-Square-Share	Students work to form individual questions, share them with a partner, join with another pair to synthesize their questions into one and share each final group's question in a whole group discussion (Stobaugh, 2019).
Quads	Students brainstorm four questions after learning a new section of content. After trading questions with another student, students answer another person's questions. Students circulate the room pairing up and answering the questions of others until all questions are answered. Students then read and evaluate all responses to check for their credibility and accuracy.
Think-Puzzle-Explore (TPE)	<p>Supports student metacognitive thinking by helping learners unpack learning goals or assess lesson/unit key concepts in a way that safely surfaces preconceptions by prompting students with:</p> <ul style="list-style-type: none"> • <i>“What do I think I know?”</i> • <i>“What puzzles me?”</i> • <i>“How might we explore?”</i> <p>When used regularly, this thinking routine is internalized for students as they transfer these questions to new learning experiences (Walsh, 2021; Ritchard & Church, 2020).</p>

Questioning Strategies to Support Formative Assessment

To make decisions about what happens next in teaching and learning, teachers must evaluate evidence by noticing the actions of learners that best reflect their understanding of the content and skills related to learning goals and success criteria. Assessments *as, for, and of* learning help educators evaluate how successful they were in implementing what works best (i.e., evidence-based instructional practices). According to John Hattie, evaluation focuses the attention on learners' progress toward what he terms their skill, will and thrill. Hattie defines **skill** as where students are in their thinking, **will** being where students are in their disposition, and **thrill** relating to students' motivations. When designing classroom formative assessment, Hattie suggests teachers keep the following questions in mind as they plan to collect meaningful evidence of student learning (Hattie, et al., 2021):

- **Questions for Evaluating Skill:**
 - Does the student focus on single ideas or one way of thinking about the experience or task, not noticing other aspects of the learning?



- Does the student work with multiple ideas, but does not yet see connections between those ideas?
- Does the student see relationships between different concepts, skills or other content?
- Does the student apply ideas to different contexts? (Walsh, 2021; Hattie, et al., 2021)
- **Questions for Evaluating Will and Thrill:**
 - Does the student recognize the difference between where he/she is and where he/she is going?
 - Does the student set goals for closing this gap?
 - Does the student apply learning strategies to close the gap?
 - Does the student self-evaluate his or her progress in closing the gap? (Walsh, 2021; Hattie, et al., 2021).

Posing intentional questions for students that are well thought out in advance helps ensure the questions asked are relevant and meaningful for students because they align to students' personal learning goals. Students can make changes to their work and adjustments to their learning strategies when effective questions are posed, and when they are given time to think and to make informed decisions (Novak & Slattery, 2017).

Forms of Questioning Tools

Teachers often use written questions in various forms to formatively assess where students are relative to a learning progression. Some of these forms include bell ringers (questions given as class begins), exit tickets (end-of-lesson checks for understanding to see if students understand and are ready to move on to new learning), homework, performance tasks, pre-planned discussion questions, reflection journals and assessments. Ideally, formative assessment items should give students an opportunity to demonstrate general mastery while pushing them to think at higher cognitive levels (Stanley, 2020). Since the ultimate goal is to empower students to engage in their own higher-order questioning, teachers must continually model the types of questions they want students asking while giving them ongoing opportunities to practice through feedback and support (Novak & Slattery, 2017).



Evidence-Based Instructional Practice # 6: Meaningful Feedback

Introduction

The formative assessment process is a key component of effective classroom instruction as students and teachers work in ongoing cycles of eliciting, interpreting and acting on evidence of student learning. At the heart of the formative assessment process is the use of descriptive and actionable feedback that allows students and teachers to make adjustments in order to close the gap between students' current level of understanding and the intended learning outcomes.

Research shows that feedback is one of the most powerful tools at a teacher's disposal and, when done well, can equate to an effect size equivalent to a 28-percentile gain in student achievement (Beesley & Apthorp, 2010). In the *Visible Learning* research, Hattie and Zierer (2019) found feedback to have an effect size ranging from .70 to .79, making it a powerful instructional strategy applicable across all disciplines and grade levels. In spite of the potential impact on learning, feedback is one of the most underutilized instructional practices.

While feedback can be powerful, it can also vary in its impact on learning. According to Hattie and Clarke (2019), **feedback serves many functions including reinforcing success, correcting errors, helping unravel misconceptions, suggesting specific improvements, giving advice for future improvement, praising, or punishing or rewarding.** "Who gives the feedback, whether it is task or ego related and how and whether it is received and acted upon are all factors in its effectiveness" (p. 6). For students to improve academically, they must receive honest, specific feedback that does not harshly judge or evaluate but encourages them to reflect on their work and think critically about how they can do better (Barron & Kinney, 2021). To tap into the power of feedback, teachers must develop an understanding of the key aspects of feedback that have the greatest capacity to positively impact student achievement, whether the feedback is from the teacher to student, student to teacher, student to student or student to self (Hattie & Clarke, 2019).

Impact of Meaningful Feedback on Student Learning

Feedback is a critical aspect of constructing memories, building executive function and "is the glue that holds the acquisition, consolidation and storage of learning together" (Alamrode, Fisher, & Frey, 2022; p. 110). Clear, descriptive feedback also supports students' cognitive development and helps to scaffold their learning. Meaningful feedback provides students with 'just-in-time' information about where they are in relation to the learning goal, helps them recognize which knowledge and skills are strong and which need improvement, and provides them with specific strategies for next steps. Once students gain a better understanding of where they are in their learning journey and the next steps they need to take to close the gap,



research shows they are more likely to take those steps and, as a result, their learning improves (Moss & Brookhart, 2019).

The quality of feedback students receive shapes their achievement motivation. Meaningful feedback increases students' autonomy and persistence in their work by "giving them the evidence they need to believe that they are, in fact, competent - and where they are not yet competent, giving them the means to become so" (Frey, Hattie, & Fisher, 2018; p. 89). When students have a clear understanding of what to do next, they see improvement as something they can control and are motivated to take those steps (Moss & Brookhart, 2019). Perseverance is impacted as well, as feedback "provides students with additional avenues of support and alternatives to the futile 'wheel-spinning' that effort alone cannot overcome" (p. 89).

Meaningful feedback also supports metacognition, which is a student's awareness of their own thinking and the use of this self-awareness to regulate their thinking. Feedback that supports self-regulation allows students to self-monitor, self-direct and can ultimately improve their performance on difficult tasks (Ruiz-Primo & Brookhart, 2018). Meaningful feedback is a critical element at every stage of the regulation process and provides support to students in (Ruiz-Primo & Brookhart, 2018; Allal, 2011; Vermunt & Verloop, 1999):

- Goal setting/orienting/planning;
- Monitoring progress toward the goal;
- Interpreting results from monitoring to adjust actions; and
- Evaluating whether the learning process has proceeded as expected and the learning goal has been achieved.

Fostering a Feedback Culture

The true power of feedback to impact learning is dependent upon the degree to which the learner views the feedback as meaningful and uses it to take action to improve. Feedback will not impact learning if students do not act on the information (Frontier, 2021; Chappuis, Brookhart, & Chappuis, 2021). So, if the most important aspect of feedback is what students do with it, then teachers must intentionally create the classroom conditions where students are open to receiving feedback (Frey, et al., 2018; Frontier, 2021).

Research consistently shows that one of the most important factors that affects students' perceptions of feedback is the relationship the student has with the teacher. Students need to know that their teacher cares about them, that they are safe, and that they will be treated respectfully by their teacher and peers when asking questions, making their thinking visible, or sharing misconceptions (Hattie & Clarke, 2019; Frey, et al., 2018). When students do not feel safe, respected or feel they do not belong, they are already at a disadvantage when provided



feedback. Their lack of trust leads to little, if any, engagement with the feedback and their motivation to act on it is mainly out of compliance (Hattie & Clarke, 2019).

In addition to student-teacher relationships, another key factor that impacts the feedback culture is the view towards making errors, being stuck or having misconceptions. Historically, “being wrong” has been seen as something to be ashamed of or to cover up and erase for fear of the stigma attached with negative perceptions of failure (Hattie & Clarke, 2019). If part of the classroom culture is to always “get things right,” then anything that needs improvement is considered “wrong.” A culture with a negative view of errors can be upsetting, disruptive, and frustrating for students resulting in decreased motivation to engage in the learning process (Hattie and Clarke, 2019; Brookhart, 2017).

Research shows that learning and feedback thrive on errors. **Classroom environments that support meaningful feedback are those in which errors are celebrated and seen as part of the learning process** (Fisher, Frey, & Hattie, 2021; Hattie & Clarke, 2019; Brookhart, 2017). One of the primary purposes for fostering a warm, trustworthy, and compassionate classroom environment is to allow learning to thrive on error. When the classroom environment values errors as part of the learning process, students are more likely to seek out and use feedback to plan and execute next steps for improvement (Brookhart, 2017). Student errors should be highlighted in a positive way, used as opportunities to relearn, and seen as part of the road to mastery. When teachers provide opportunities for students to discuss misconceptions and errors and encourage them to learn from those errors through self-correction, students’ confidence increases, and they are more likely to try a range of strategies when dealing with errors (Hattie & Clarke, 2019).

For more information about the learning environment, please see [EBIP 1: Establishing the Learning Environment](#).

Feedback and the Formative Assessment Process

The purpose of giving and receiving feedback is to close the gap between students’ current level of understanding and the intended learning outcomes. Feedback is provided to students so they know where to go next in their learning and is received by teachers to inform decisions about where to go next in instruction (Almarode, et al., 2022). **Feedback should not be viewed as a one-way transmission model, but as one that operates between teacher and student.** Students’ work, their understandings, questions, misconceptions, and errors are all feedback to the teacher about his/her own performance (Frey, et al, 2018).

Meaningful feedback should help students become more consciously aware of what they are doing, the decisions they make as they are doing it, and the problem-solving strategies and processes they use to correct, revise or improve their work. (Frey, et al, 2018). Feedback should



focus on what students are expected to say and do to demonstrate they have met the learning goals and success criteria and is only meaningful to students when they use it to inform their next steps to improve their learning (Almarode, et al., 2022; Frontier, 2021). In order for teachers to provide meaningful feedback and for students to understand and take action on it, both the teacher and the students must have (Frey, et al., 2018):

- A clear and shared understanding of the learning goals and success criteria;
- The ability to determine present level of performance;
- Strategies and processes that can be put into action; and
- Ways to gauge next steps to move forward.

To increase the likelihood that feedback is received and has an impact on learning, feedback should empower students to answer three critical questions about their learning: (1) “Where am I going?” (2) “Where am I now?” and (3) “Where to next?” (Hattie & Timperley, 2007). Table 5.18 provides a summary of the three feedback questions and their purpose in providing meaningful feedback to students.

Table 5.18. *Three Questions for Effective Feedback*

Three Questions for Effective Feedback	Purpose
“Where am I going?”	<ul style="list-style-type: none"> • “Feed Up” • Addresses the learning goals and success criteria • Provides a reminder or reframe of the intended learning outcomes
“Where am I now?”	<ul style="list-style-type: none"> • “Feed Back” • Compares students’ current evidence of learning to the intended learning outcomes • Highlights a difference or gap in where students are right now and where they are headed
“Where to next?”	<ul style="list-style-type: none"> • “Feed Forward” • Provides individualized scaffolding or support to all students • Identifies next steps needed to close the gap between current performance and the learning goals and success criteria

Adapted from Almarode, et al., 2018; Fisher, et al., 2021; Hattie & Timperley, 2007



The formative assessment process is a continuous cycle in which teachers establish learning expectations, design lessons and tasks to elicit evidence of student understanding, identify gaps in students' knowledge and performance, monitor progress towards the goals, provide feedback, and then take action based on the results. Feedback is an important component of the formative assessment process and should be a part of ongoing teaching and learning. Students' responses, insights and behaviors are all feedback to the teacher and used to guide next steps in learning. **Formative feedback is most effective when combined with other key formative assessment practices including clarifying and sharing clear learning goals and success criteria and eliciting evidence of student thinking through lessons, assignments and tasks aligned to those goals** (Brookhart, 2017).

Clear Learning Goals

Clarifying and sharing clear learning goals and success criteria is a fundamental requirement for both feedback and learning. Learning goals and success criteria show students where to focus their time and effort and provide specific reference points for feedback. Success criteria help focus feedback on the most important features in students' work that are essential to reaching the learning goal, as well as provide the means for measuring progress along the way (Ruiz-Primo & Brookhart, 2018).

When students are not clear about what they are supposed to learn and how success will be measured, they often complete tasks and assignments merely out of compliance. They tend to spend their time trying to figure out or guess what the teacher wants them to do rather than engaging with the task and its intended learning (Hattie & Clarke, 2019). In this case, students tend to view any feedback given simply as more teacher directions. However, when students are actively engaged in the learning process and receive feedback aligned to the learning goals and success criteria, students are more equipped to respond to the three feedback questions to improve their learning: "Where am I going? "Where am I now? "and "Where to next?" (Ruiz-Primo & Brookhart, 2018).

For more information about clear learning goals, please see [EBIP 2: Clarifying and Sharing Clear Learning Goals](#).

High-Quality Tasks

In addition to clarifying and sharing clear learning goals and success criteria, teachers must ensure the work students are asked to do embodies those goals and is formatively assessed throughout the learning process using the success criteria. High-quality assignments and tasks aligned to clear criteria make meaningful feedback possible whether the "task" is responding to a question or prompt, participating in a class discussion, creating a model, writing an essay, or solving a problem (Ruiz-Primo & Brookhart, 2018). "Getting underneath student understanding, finding out what they really think, is the starting point for all feedback, from whichever



direction, because only then can the feedback be appropriately constructed to provide advice” (Hattie & Clarke, 2019; p. 4).

When assignments and tasks are of poor quality and/or do not match the intended learning outcomes in both content and cognitive level, the lesson will not provide appropriate evidence of student thinking and cannot be used to measure progress towards the goal. When teachers intentionally plan and utilize tasks, assignments and other opportunities to respond that align with the learning goals and success criteria, the resulting evidence of student understanding paves the way for meaningful feedback for both students and teachers (Almarode & Vandas, 2018; Ruiz-Primo & Brookhart, 2018). One useful resource that can support teachers in designing or selecting high-quality tasks aligned to the *Kentucky Academic Standards* is the [Assignment Review Protocols](#).

As a part of designing or selecting high-quality tasks that make student thinking visible, teachers need to anticipate likely student responses in order to proactively plan for different types of potential feedback that can improve student learning. Ruiz-Primo and Brookhart (2018) recommend that teachers never give a task or assignment to students that the teacher has not completed beforehand. Completing the task ahead of time allows the teacher to anticipate potential errors students may make and to prepare questions and instructional moves in advance that help students focus on the critical aspects of the task when they complete it. “This helps teachers to develop an interpretative state of mind and to be prepared to provide more appropriate, robust, meaningful feedback, either orally or using instructional moves” (Ruiz-Primo & Brookhart, 2018; p. 91).

Feedback vs Grades

According to Brookhart (2017), feedback is “just-in-time, just-for-me information delivered when and where it can do the most good” (p. 1). Information provided to students at the end of a unit, project, task, or assignment is evaluation, not feedback. **Meaningful feedback allows students the opportunity to take action and use the information to improve learning during the learning process.** When given at the end of the task, the information is neither actionable since the task is finished, nor useful because there is little to no opportunity to apply it (Fisher, et al., 2018).

When students are given a grade along with comments/suggestions, students tend to focus more on the grade and ignore the comments, because a grade typically signifies, “You’re done” (Chappuis, et al., 2021; Nottingham & Nottingham, 2017). Students see no point in revising their work based on the comments because the window for learning has closed. Often, “students will look at their grades first and, if it is a good grade, think to themselves, ‘Why do I need to improve?’ And if they got a bad grade, then they think, ‘Why try to improve? I’m no good at this anyway’” (Nottingham & Nottingham, 2017; p. 16).



At the heart of formative assessment and feedback is providing students opportunity to respond during learning when there is still time to take action and improve. **Teachers should deliberately plan lessons that include opportunities for students to use feedback which helps to cultivate a growth-oriented mindset and encourage students to view mistakes as a natural part of the learning process** (Chappuis, et al., 2021). Hattie and Clarke (2019) recommend teachers utilize ongoing and mid-lesson stops that direct students’ attention back to the learning goal and success criteria, as well as the models and examples of what success looks like to help them self-assess where they are and determine their next steps. These strategic pauses can help students focus their time and effort, improve their ability to self-regulate and increase their motivation to engage in the learning process.

When teachers provide meaningful feedback that is likely to inform and motivate students and when they determine instructional next steps based on students’ current understanding, all parts of the formative assessment process benefit. Students gain a better understanding of the learning goals and success criteria, acquire information that can be used for improvement and are more likely to take next steps in learning (Ruiz-Primo & Brookhart, 2018).

Providing Meaningful Feedback

Research shows that feedback has the potential to influence student outcomes positively or negatively. Some types of feedback are less effective than others and not all feedback is useful (Nottingham & Nottingham, 2021). “The type of feedback teachers provide, however well meaning, can in fact inhibit learning, so it is crucial to understand how to best leverage this powerful tool” (Frey, et al, 2018; p. 78). The power of feedback lies in its potential to move learning forward and must be structured in a way that helps students progress from surface learning to deep learning and enables them to transfer that learning to new problems or situations (Almarode & Vandas, 2018).

Feedback in the form of praise or rewards is one of the least effective types since it does not contain real information about student learning and should not be regarded as actual feedback. Feedback that is vague and/or general will not build student agency and help close the gap between students’ current level of understanding and the intended learning outcomes (Fisher, et al., 2021). **For feedback to improve learning, the content of the feedback must focus on reducing the gap between a student’s current understanding or performance and what is expected and seek to improve students’ learning strategies that enable them to self-regulate their own learning.** Feedback “should contain information that is under the students’ control (e.g., effort, ways to monitor or check work, strategies to set up a work plan), in contrast to evaluating an individual’s ability or personality” (Ruiz-Primo & Brookhart, 2018; p. 16).



Characteristics of Meaningful Feedback

While there is no one formula for providing meaningful feedback, research does point to several characteristics that can maximize the chances that students will receive and take action on the feedback and improve their learning. Table 5.19 summarizes three characteristics of meaningful feedback (Fisher, et al., 2018; Chappuis, et al., 2021; Almarode and Vandas, 2018).

Figure 5.19. *Characteristics of Meaningful Feedback*

Characteristic	Description
Timely	<ul style="list-style-type: none">• Occurs during the learning process, when there is still time for students to act on the feedback• Given while students are still mindful of the learning goals and success criteria and still working towards mastery of those goals
Specific	<ul style="list-style-type: none">• Highlights specific strengths as well as area(s) of improvement• Identifies what was done correctly, describes a feature of quality present in the work, and/or highlights effective use of a strategy or process• Focuses on a narrow range of the most important portions of student work related to the most relevant success criteria• Highlights the area(s) of focus for continued learning by identifying a mistake, describing a feature of quality needing work, or a problem with a strategy or process
Actionable	<ul style="list-style-type: none">• Limited to the appropriate amount of advice students are able to act on in a given time• Directs students toward specific steps they can take to close the gap between where they are and the intended learning outcomes• Developmentally and cognitively appropriate• Offers just enough guidance that the student is pointed in the right direction while not taking the thinking and cognitive challenge away from the student• Offers a reminder, asks a question, and/or makes a specific suggestion for action to take

Students must understand the feedback for it to be useful and for them to take action on it.

“When students are lost in understanding the content of the feedback, they are not likely to



know what to do with it; it may even cause them to feel as though they have failed twice. ‘I don’t know how to do this, and I don’t understand what my teacher’s telling me to do about it’ (Chappuis, et al, 2021; p. 98-99). Teachers should always check to determine if students understand and can interpret the feedback provided. Possible questions teachers can ask to check for understanding include (Hattie & Clarke, 2019).

- “What did you understand from what I just said?”
- “How might you use this feedback in your next learning step?”
- “What else might you need from me right now to help in your learning?”

For feedback to be meaningful, students’ work needs to demonstrate at least partial understanding of the learning goal and success criteria. Chappuis, et al., (2021) cautions that feedback is not always the best choice for an instructional intervention. **If a student’s work does not demonstrate even partial mastery and there is little to nothing of substance to use as the basis for success comments, attempting to teach through feedback is generally ineffective. At this point, offering further instruction and re-teaching is the best option.**

Levels of Feedback

One of the main reasons feedback can vary greatly in its ability to improve student learning is that feedback must be aligned with where the students are in the learning cycle. When misalignment occurs, then the feedback is likely to be misinterpreted, misheard, or ignored (Hattie & Clarke, 2019). According to research, corrective feedback paired with information about processes and self-regulation has the greatest potential to improve student learning (Wisniewski, B., Zierer, K., & Hattie, J., 2020). Students benefit most from feedback that helps them to not only understand what mistakes they made, but also why they made those mistakes and what they can do to avoid them next time.

Research has identified three types of feedback that support and improve student learning: **task, process** and **self-regulation** (Hattie & Timperley, 2007). “The timing in the use of each type of feedback is dependent on the learning goals, success criteria, and current level of performance of the student” (Almarode & Vandas, 2018; p. 136). Figure 6.3 provides a summary of each feedback level, along with examples of teacher/student prompts to support each type.

Table 5.20. *Levels of Feedback*

Level	Description	Teacher/Student Prompts
Task Feedback	<ul style="list-style-type: none"> • Also known as corrective feedback • Provides students with information about the accuracy and completeness of a task 	<ul style="list-style-type: none"> • How well has the task been performed? Is it correct or incorrect?



	<ul style="list-style-type: none"> • Supports the acquisition, storing, reproduction and use of knowledge • Supported by teacher modeling, use of examples and non-examples, as well as clear explanations of procedural steps, key features and context • Most useful when students are engaged in surface learning of new content to develop students' understanding of the content, ideas and terms 	<ul style="list-style-type: none"> • Does the answer meet the success criteria? • How can the student elaborate on the answer? • What did the student do well? • Where did the student go wrong? • What is the correct answer? • What other information is needed to meet the criteria?
Process Feedback	<ul style="list-style-type: none"> • Provides feedback to students on their thinking and the processes and/or strategies used to complete a task • Supports students in making connections and use of multiple strategies for error detection • Focuses on relationships between ideas and students' strategies for evaluating the reasonableness of an answer or solution • Provides cues about different strategies for approaching a problem or task • More effective than task-level feedback for deepening learning and creating understanding • Most useful when students develop proficiency of the specific content, ideas and terms 	<ul style="list-style-type: none"> • What are the strategies needed to perform the task? Are there alternative strategies that can be used? • What is wrong and why? • What strategies did the student use? • What is the explanation for the correct answer? • What other questions can the student ask about the task? • What are the relationships with other parts of the task? • What other resources are provided that can help the student? • What is the student's understanding of the concepts/knowledge related to the task?
Self-Regulation Feedback	<ul style="list-style-type: none"> • Focuses attention on the students' use of self-regulatory skills and promotes metacognition through self-verbalization, self-questioning and self-reflection 	<ul style="list-style-type: none"> • How can I monitor my own work? • How can I reflect on my own learning?



	<ul style="list-style-type: none"> • Fosters students’ ability to know what to do when they approach a new and different problem, are stuck or have to apply their understanding in a new way • Enhances self-evaluation skills, generates greater confidence to engage further in the task and helps students decide what to do for the best outcome • Appropriate for students who have reached a deep level of conceptual understanding and are armed with multiple strategies as they transfer their learning to more rigorous tasks 	<ul style="list-style-type: none"> • What further doubts do I have regarding this task? • How does this compare with ...? • What does all this information have in common? • What learning goals and/or success criteria have I achieved? • How have my ideas changed? • Can I now teach someone else how to ...?
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Adapted from Almarode & Vandas, 2018; Hattie & Clarke, 2019; Hattie, 2012)

Most of the feedback teachers provide to students is typically in the form of task feedback. Students tend to welcome this type because it is easier to apply than process or self-regulation feedback, which requires deeper, more conceptual thinking. However, teachers need to be careful they do not stay with task feedback, as doing so reinforces to students that this is the prime purpose of the lesson (Fisher, et al., 2021). As students demonstrate understanding of the content, ideas and terms, then the feedback increasingly shifts to process feedback. “Like task feedback, process feedback should be specific and constructive and should support learners’ pathways toward self-regulation feedback. That is, it should deepen thinking, reasoning, explanations, and connections” (Almarode & Vandas, 2018; p. 138). When students have misconceptions or a gap arises in foundation or background learning, they benefit from both task and process feedback.

Students who have reached a deep level of conceptual understanding and are equipped with multiple strategies benefit from self-regulation feedback as they transfer their learning to more rigorous tasks. At this point, students see themselves as their own teachers with clear knowledge about where they are in their own learning process, how they are progressing to or beyond the learning goal and success criteria, and they can monitor their own progress. Even at this stage students need scaffolding as they progress toward this metacognitive awareness, and this can be supported by teaching students the art of self-questioning. Teachers can model this through the questions they pose to students as students move from processing to and through self-regulation (Almarode & Vandas, 2018). As students shift from mastery of current learning goals to new learning goals in a given instructional unit, they will often require more task and process feedback initially until they once again transition from surface level learning to deeper levels of content understanding.



Peer-and-Self Feedback

Peer-and-self assessment plays a critical role in a strong formative feedback culture and helps students improve their self-regulation skills and their sense of self-efficacy. As they learn to become more self-regulatory, students are able to monitor, direct and regulate their own actions as they progress toward the learning goals. Both peer-and self-assessment are key components in the formative feedback loop and require students to understand and use the success criteria (Moss & Brookhart, 2019).

A review of the research on both self-and-peer assessment shows that a classroom culture characterized by strong teacher and peer relationships and a sense of psychological safety and trust are key factors in the success of these strategies (Andrade & Brown, 2016; Panadero, 2016 in Moss & Brookhart, 2019; p. 70). Teachers must take the time to intentionally “attend to the classroom learning culture before and during use of either of these strategies. Otherwise, these strategies may fail, and they may undermine students’ feelings of safety” (Moss & Brookhart, 2019; p. 70).

Peer Feedback

Peer assessment involves students applying the success criteria to another student’s work in order to provide formative feedback the peer may use for improvement. In terms of the formative assessment process, **peer assessment is best viewed as a collaborative learning activity focused on increasing students’ clarity of the learning goals and the success criteria** (Panadero, 2016; Strijbos, 2016; Moss & Brookhart, 2019). Providing students the opportunity to examine and comment on one another’s work results in the following benefits (Chappuis, et al., 2021; p. 102-103):

- It deepens understanding of quality for the student who is providing the feedback.
- It allows for students to receive comments on their work in a relatively short period of time, thereby increasing feedback opportunities for all.
- Some students are more apt to be open to feedback from a peer, which may be seen as less evaluative than that from a teacher.
- Students can often come up with suggestions for next steps because they are encountering the same issues.
- After giving someone else feedback, students are better able to view their own work through another’s eyes, spurring new thoughts and insights useful in revising their own work.

Teachers can model feedback for students by using samples of student work, reviewing the learning goal and success criteria with the whole class, and analyzing the work in light of the criteria and discussing what feedback to provide and why. **Teachers should also provide opportunities for students to practice giving feedback in a controlled environment.** A possible way teachers might structure this practice is outlined below (Chappuis, et al., 2021; p. 103):



- The teacher selects an anonymous sample of student work exhibiting both strengths and areas needing improvement.
- Students work in pairs, with one assuming the role of “student” and the other that of “teacher.” Each separately examines the sample and uses the success criteria to identify strengths and areas of need.
- Student pairs then meet in a simulated three-minute feedback conference. The “student” shares their thoughts first, and the “teacher” follows up with anything the “student” might have overlooked or with which the “teacher” disagrees. While the “teacher” talks, the “student” takes notes.
- At the end of the three minutes, the classroom teacher conducts a group debrief of the simulation, asking students what was easy and what was difficult about offering or receiving feedback. The class brainstorms solutions to potential problems.
- The students switch roles and engage in another round of the simulation with a different anonymous example.

The best time for peer feedback is after students have developed proficient understanding of the content, concepts and skills and are ready to examine connections and relationships among those concepts and ideas. If students are still in the surface level stage of learning, it is often more effective to re-teach concepts than to engage in peer feedback. Engaging in peer feedback too early in the learning process may result in students reinforcing wrong ideas and concepts. “But when asking students to play with ideas, explore relations between ideas and extend their thinking, peer feedback can be most powerful” (Hattie & Clarke, 2019; p. 97).

When students practice applying the criteria for good work through peer assessment, it helps to build general knowledge about the learning goal more than individuals’ skills at meeting it. “Because peer assessment may not be the most direct path to improving students’ own learning, it should be used when the purpose of a lesson is to provide external feedback to classmates about some work they will have an opportunity to revise” (Brookhart, 2017; p. 84). Following peer feedback, teachers should build in time for students to apply the peer feedback and their understanding of the learning goals and success criteria as they review their own work.

Self-Feedback

Research consistently shows that achievement improves when students are required to think about their own learning, articulate what they understand and can do well, and determine what they still need to learn (Black & Wiliam, 1998; Hattie, 2009; Chappuis, et al., 2021). **Self-assessment (and self-feedback) should be viewed as both an instructional and an assessment strategy allowing students to evaluate their own work against the learning goals and success criteria and adjust learning strategies as needed.** “Self-assessment increases students’ interest in feedback because the feedback is ‘theirs’; it answers their own questions and helps them to develop the self-regulation skills necessary for using any feedback” (Brookhart, 2017; p. 80).



Self-assessment is grounded in students' response to the three primary feedback questions beginning with, "Where am I going?", then reviewing their own work or their thinking to determine, "Where am I now?" and finally answering, "Where to next?" Teachers need to intentionally model and teach self-assessment skills by helping students learn how to apply criteria to their own work, connect their success at doing so with their further learning and see that applying the success criteria helps them participate in the formative learning cycle. (Moss & Brookhart, 2019). The following strategies can help maximize the effectiveness of self-assessment (Andrade and Valtcheva, 2009; Moss & Brookhart, 2019; Ruiz-Primo & Brookhart, 2018):

- Clearly define the success criteria for the work students are going to assess.
- Design tools (e.g., templates, checklists or sets of reflective questions) that help students use the criteria.
- Teach students how to apply the criteria to examples of work and provide them opportunities to practice.
- Give students feedback about the quality of their feedback.
- Help students learn to use their feedback to improve.
- Provide sufficient time for students to use the feedback they generate.
- Use self-assessment formatively, not as a part of grading.

Self-assessment should occur regularly throughout the learning process to help build students' confidence, allow them to make plans for improvement and reinforce their awareness of these skills (Fisher, et al., 2021). "The more proficient a learner is at accurately assessing his or her own work, the more likely that student is able to prioritize and strategize next efforts to learn. Additionally, students who can self-assess are more responsive to feedback because they understand how feedback works" (Frontier, 2021; pg. 116).

Students also need opportunities to set goals as a result of their self-assessments, which moves students from "Where am I now" to "Where to next?" and "How can I get there from here?" When students successfully set, pursue and accomplish their own goals, it increases their confidence, independence and self-efficacy. When creating a goal, students should begin with a clear statement of the intended learning outcomes and a description of their current status in relation to those outcomes. Students then create an action plan that specifies (Chappuis, et al., 2021):

- Steps they will take to achieve the goal;
- When and where they will do the work;
- Who they will work with; and
- Materials they will need to support them along the way.



As part of an effective feedback culture, both self-assessment (internal feedback) and teacher and peer feedback (external feedback) provide students the means to control their learning. As students encounter new concepts and skills, more teacher feedback is required that describes students' performance and offers strategies for improvement. The strategies teachers suggest and model early in the learning process become part of the students' repertoire for practicing that skill and understanding the content. Students begin to internalize the success criteria included in the teacher feedback as they review their own work (Brookhart, 2017). Over time, less teacher feedback is needed and students engage in more and more self-assessment as they deepen their conceptual understanding of the content and can identify their own learning strategies to continue progressing toward the goals.



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Appendix E

Evidence-Based Instructional Practices Toolkit

Evidence-Based Instructional Practice	Professional Learning Support	Content-Specific Support
Establishing the Learning Environment	<ul style="list-style-type: none"> • EBIP 1 Overview Video • EBIP 1 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 1: Mathematics • EBIP 1: Reading and Writing • EBIP 1: Science • EBIP 1: Social Studies
Clarifying and Sharing Clear Learning Goals	<ul style="list-style-type: none"> • EBIP 2 Overview Video • EBIP 2 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 2: Mathematics • EBIP 2: Reading and Writing • EBIP 2: Science • EBIP 2: Social Studies
Explicit Teaching and Modeling	<ul style="list-style-type: none"> • EBIP 3 Overview Video • EBIP 3 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 3: Mathematics • EBIP 3: Reading and Writing • EBIP 3: Science • EBIP 3: Social Studies
Discussion	<ul style="list-style-type: none"> • EBIP 4 Overview Video • EBIP 4 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 4: Mathematics • EBIP 4: Reading and Writing • EBIP 4: Science • EBIP 4: Social Studies
Questioning	<ul style="list-style-type: none"> • EBIP 5 Overview Video • EBIP 5 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 5: Mathematics • EBIP 5: Reading and Writing • EBIP 5: Science • EBIP 5: Social Studies
Feedback	<ul style="list-style-type: none"> • EBIP 6 Overview Video • EBIP 6 Facilitation Considerations 	<ul style="list-style-type: none"> • EBIP 6: Mathematics • EBIP 6: Reading and Writing • EBIP 6: Science • EBIP 6: Social Studies

